DOCUMENT RESUME

ED 346 103	SP 033 892
TITLE	Education for Self-Responsibility IV: Nutrition Education Curriculum Guide. Grade 9-Grade 12.
INSTITUTION	Texas Tech Univ., Lubbock. Home Economics Curriculum Center.
SPONS AGENCY	Texas Education Agency, Austin. Div. of Curriculum Development.
PUB DATE	92
NOTE	283p.; For grades K-4, and grades 5-8 curriculum guides, see SP 033 890-891.
AVAILABLE FROM	Texas Education Agency, 1701 North Congress Avenue, Austin, TX 78701.
PUB TYPE	Guides - Classroom Use - Teaching Guides (For Teacher) (052)
EDRS PRICE	MF01/PC12 Plus Postage.
DESCRIPTORS	Breakfast Programs; *Cultural Awareness; Cultural Pluralism; Habit Formation; *Health Promotion; High Schools; *Learning Activities; *Lesson Plans; Lunch Programs; *Nutrition Instruction; Parent Participation; Program Descriptions; Program Implementation; Special Needs Students; State Curriculum Guides
IDENTIFIERS	Child Nutrition Act 1966; Department of Agriculture; Food and Nutrition Services; Texas

ABSTRACT

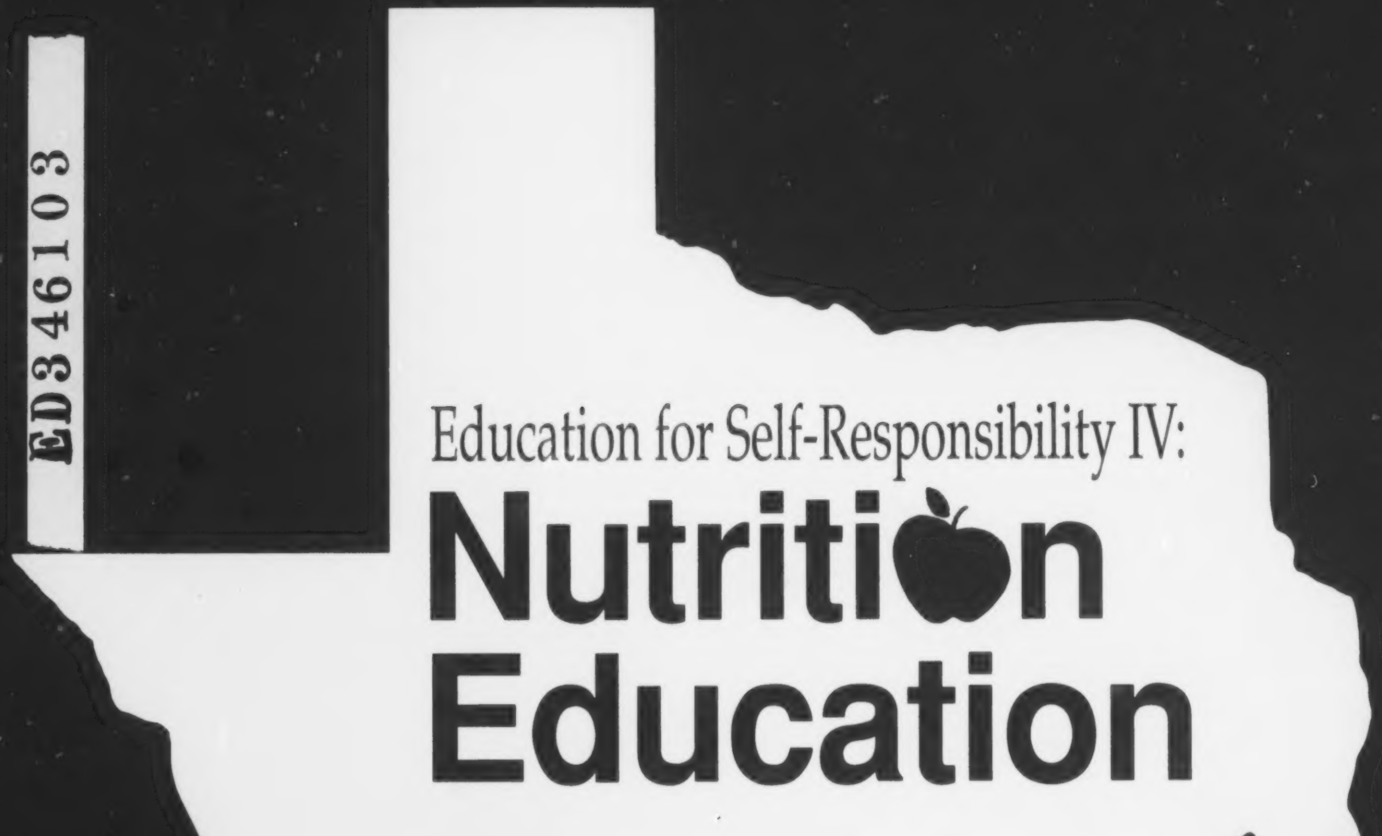
This is the third part of a three-part curriculum guide dedicated to improving the nutritional status of children and adolescents as well as inspiring lifetime habits of healthy eating. It is also a total nutrition education program that encompasses nutritional aspects of a student's daily life both at school and at home. Teachers are provided with specific grade-level lesson plans and learning activities that include student handouts and worksheets, teacher resource pages, and overhead transparency masters. The high school guide is organized into five sections. The first section describes the program including cultural awareness information, the interaction of nutrition education with school food service, parent involvement, and program visibility. Section 2 discusses implementation of the ESR IV curriculum guide. The third section addresses modifications of the program for special populations. Section 4 presents an instructor's resource guide for teaching nutrition education. The final section presents grades 9-12 nutrition lessons emphasizing diet-related diseases, prevention techniques, and current nutrition issues. Nine appendices include: suggested teacher resources; bibliography; a pattern for daily food choices, and school breakfast and lunch patterns; recommended dietary allowances; a food composition table; dietary guidelines for Americans; a glossary of terms; suggested instructional strategies; and a health hotline of agencies and organizations. (LL)

****

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

****

ED346103



Education for Self-Responsibility IV:

Nutrition Education

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it

☐ Minor changes have been made to improve reproduction quality

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

SP033892

Texas Education Agency / Austin, Texas

Curriculum Guide
Grade 9 - Grade 12

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

L. Kemp

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

BEST COPY AVAILABLE

EDUCATION FOR SELF-RESPONSIBILITY IV: NUTRITION EDUCATION

Curriculum Guide

GRADE 9 - GRADE 12

Developed and disseminated by:

Home Economics Curriculum Center
Texas Tech University
College of Home Economics
Lubbock, Texas

Through a contract with:

Texas Education Agency
Division of Curriculum Development
Comprehensive School Health Programs
Austin, Texas

1992

This publication is not copyrighted; all or part of the text may be duplicated.

For information on ordering additional copies of the curriculum guide, contact the Publications Distributions Office at the Texas Education Agency.

Texas Education Agency
1701 North Congress Avenue
Austin, Texas 78701

512-463-9744

ACKNOWLEDGEMENTS

State Board of Education
(State Board for Vocational Education)

Carolyn Honea Crawford, Beaumont
Chairman of the State Board of Education District 7

Bob Aiken, Commerce
Vice Chairman
of the State Board of Education
District 9

Mary Helen Berlanga, Corpus Christi
Secretary
of the State Board of Education
District 2

Raymond A. Alexander, Houston
District 4

Jack Christie, Houston
District 6

Emmett J. Conrad, Dallas
District 13

Will D. Davis, Austin
District 10

Monte Hasie, Lubbock
District 15

William L. Hudson, Wichita Falls
District 14

Geraldine Miller, Dallas
District 12

Jane Nelson, Double Oak
District 11

Rene Nuñez, El Paso
District 1

Mary Knotts Perkins, Lufkin
District 8

John H. Shields, San Antonio
District 5

Esteban Sosa, San Antonio
District 3

Lionel R. Meno, Commissioner of Education
(Executive Officer of the State Board of Education)

ACKNOWLEDGEMENTS

Committees
of the
State Board of Education

Personnel
Rene Nuñez, Chairman
Jack Christie
Emmett J. Conrad
Carolyn Honea Crawford
John H. Shields

Students
Geraldine Miller, Chairman
Raymond A. Alexander
Mary Helen Berlanga
Monte Hasie
Mary Knotts Perkins

School Finance
Will D. Davis, Chairman
Bob Aikin
William L. Hudson
Jane Nelson
Esteban Sosa

Long-Range Planning
Emmett J. Conrad, Chairman
Raymond A. Alexander
Jack Christie
Carolyn Honea Crawford
Will D. Davis
Jane Nelson
Mary Knotts Perkins
John H. Shields

Permanent School Fund
Esteban Sosa, Chairman
Bob Aikin
Mary Helen Berlanga
Monte Hasie
William L. Hudson
Geraldine Miller
Rene Nuñez

ACKNOWLEDGEMENTS

Texas Education Agency

This publication was developed under the direction of Agency staff members in the office of the Associate Commissioner for Curriculum and Assessment.

Commissioner of Education	Lionel R. Meno
Associate Commissioner for Curriculum and Assessment	Marvin Veselka
Senior Director of Curriculum Development	Leroy F. Psencik
Director of Programs Comprehensive School Health	Sunny Thomas-Allcorn
Program Director Nutrition Education Program	Peggy Frias-Lynch
Education Specialist Nutrition Education Program	Linda Crawford

The Child Nutrition Act of 1966, as amended, and the Child Nutrition Division of the Food and Nutrition Service of the U.S. Department of Agriculture through the Child Nutrition Programs Division of the Texas Education Agency provided funding for *Education for Self-Responsibility IV: Nutrition Education* and the accompanying training materials.

ACKNOWLEDGEMENTS

The Home Economics Curriculum Center at Texas Tech University produced the *Education for Self-Responsibility IV: Nutrition Education* curriculum guide with the help of committees of representatives from school districts, education service centers, universities, and other agencies and organizations from different geographic regions of Texas.

Home Economics Curriculum Center Staff
Marilyn Wragg, Director
Lynn K. Perrin, Project Coordinator
Tricia Hays, Cultural Materials Specialist

Primary Curriculum Writers
Doris Elkins Dixon
Connie Dolarian
Dana Norman
Flo Touchstone

Contributing Writers
Joyce Cheatham
Jean Flowers Foster
Martha McCabe

Artist
Ben C. Sum

Editor
Lenda Olson Ziegler

Editorial assistance provided by:
Jeffrey L. Chambers
Dawna Cowan
Karen Hurdle
Sandra L. Hurdle
James C. Powell, IV
Elaine Maria Weseman

Student Assistants
Eva Mutai
Amy Sellers

Curriculum Writing and Review Committee
Anne Anderson
Texas Beef Industry Council

Jane Bagnall
American Heart Association

Marsha Beckermann
University of Texas at Austin

Molly Berger
Region IV Education Service Center

Margaret Briley
University of Texas at Austin

Jean Castleberry
Lubbock ISD

Nancy Cise
Texas Education Agency

Jimmy Collins
Seagraves ISD

Clara Contreras
Region I Education Service Center

Nelma Dodd
Mesquite ISD

Margaret Ellis
Wichita Falls ISD

Nancy Evans
Ysleta ISD

Betty Gregory
Harris County Department of Education

Cathy Harris
Region XVIII Education Service Center

Mike Hill
American Cancer Society

Laine Horton
Region X Education Service Center

Judy Jonas
Texas Association of School Administrators

Sue Kaulfus
Seguin ISD

Barbara Keir
Texas Department of Health

Ellen Kelsey
American Heart Association

Carolyn Klein
Texas Education Agency

Brenda Knowles
Associated Milk Producers Incorporated

Roberta Laundy
Bastrop ISD

Yvonne Lepley
Coldspring-Oakhurst CISD

Margaret Lopez
Region I Education Service Center

Martha Maley
Beeville ISD

Marion Miller
Weslaco ISD

Maria Mora de Gamble
Region XVII Education Service Center

Rita Newman
Dallas ISD

Barbara Rippey
Albany ISD

Roger Rodriguez
San Antonio ISD

Deborah Simpson
Texas Department of Human Services

Linsae Snider
Region XVII Education Service Center

Carol Summy
Blanco ISD

Patricia Teaster
Pasadena ISD

Maria Torres
Region XX Education Service Center

LaNelle Wiley
Region X Education Service Center

Eddie Williams
Beaumont ISD

Alea Williams
Tyler ISD

Rosa Winn
Region XIII Education Service Center

ACKNOWLEDGEMENTS

School Food Service Review Committee

Cecilia Bockoven
Dallas ISD

Maris Coggins
Spring Branch ISD

Barbara Cunningham
Spring Branch ISD

Michelle Davis
White Settlement ISD

Patricia Grillos
Midland ISD

Louise Lapeze
U.S. Department of Agriculture

Joyce Lyons
Aldine ISD

Dora Rivas
Brownsville ISD

Karla Rodgers
Austin ISD

Judy Sargent
Birdville ISD

Cynthia Zawieja
Bryan ISD

TABLE OF CONTENTS

ACKNOWLEDGEMENTS iii

THE NUTRITION EDUCATION PROGRAM 1
Education for Self-Responsibility 1
Cultural Awareness 2
The Interaction of Nutrition Education with School Food Service 3
Parent Involvement 6
Program Visibility 7

IMPLEMENTING THE *ESR IV* CURRICULUM GUIDE 9
ESR IV Goals 9
ESR IV Objectives 10
Scope and Sequence 10
Organization of *ESR IV* 17
Using the *ESR IV* Lessons 18
Resources 19
Training 19
Red Flags 20
Recommendations for Using *ESR IV* 22
Using Other Curricular Materials 23
Evaluation 24

MODIFYING *ESR IV* FOR SPECIAL POPULATIONS 27
Special Education 27
Compensatory Education 29
Bilingual Education 30
Migrant Students 32
Gifted and Talented Students 33
Multicultural Sensitivity 35

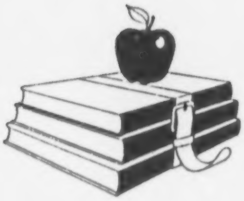
INSTRUCTOR'S RESOURCE GUIDE FOR TEACHING NUTRITION EDUCATION 37
Basic Nutrition Principles 37
Selecting a Balanced Diet 50
Nutritional Needs During the Life Cycle 52
Cultural Aspects of Food 64
Nutrition Issues 65
References 73

GRADE 9 THROUGH GRADE 12 75
Grade 9 through Grade 12 Nutrition Lessons 77

APPENDICES 249
Appendix A: Suggested Teacher Resources 249
Appendix B: Bibliography 255
Appendix C: A Pattern for Daily Food Choices 259
School Breakfast Pattern 260
School Lunch Pattern 261
Appendix D: Recommended Dietary Allowances 263
Appendix E: Food Composition Table 265
Appendix F: Dietary Guidelines for Americans 269
Appendix G: Glossary of Terms 271
Appendix H: Suggested Instructional Strategies 275
Appendix I: Health Hotline of Agencies and Organizations 277

The Nutrition Education Program

EDUCATION FOR SELF-RESPONSIBILITY



Nutrition is a multifaceted science that affects all people, regardless of age, gender, or nationality. Changes in lifestyles, eating patterns, and eating habits have brought renewed attention to the relationship between nutrition and optimal health and wellness. Nutrition education is vital to the long range improvement of public health.

An integral part of educating children is helping them to understand their health and nutritional needs. Behavioral, emotional, intellectual, and physical growth is dependent on good nutrition and health care, and schools are the most effective community network for providing nutrition education. It is important to feed the mind with sound nutrition knowledge at the same time the child is making choices for feeding the body.

Education for Self-Responsibility IV: Nutrition Education (ESR IV) is a three volume curriculum guide dedicated to improving the nutritional status of children and adolescents as well as inspiring lifetime habits of healthy eating. *ESR IV* is a total nutrition education program that encompasses nutritional aspects of the child's daily life both at school and at home. The *ESR IV* curriculum guide provides teachers with specific grade-level lesson plans and learning activities that include student handouts and worksheets, teacher resource pages, and overhead transparency masters.

The *ESR IV* sample lessons contain instructional strategies that cover the following concepts:

- basic principles of nutrition including the relationship of good nutrition, health, and wellness
- development of skills needed to make wise food choices and to develop healthy dietary habits
- nutritional needs throughout all stages of the life cycle
- increased awareness of different cultures with emphasis on cultural dietary practices
- investigation and analysis of current nutrition issues including diet and disease, eating disorders, fad diets, weight control, and physical fitness as well as new developments and trends in the food industry

The *ESR IV* total program involves the entire school campus taking an active role in nutrition education. Administrators, teachers, school food service personnel, and school health professionals must work together to reinforce the new nutrition knowledge and skills for making wise food choices that are being taught throughout the *ESR IV* lessons. School vending machines filled with nutritious foods such as fruit, fruit juices, sandwiches, and yogurt strengthen the school's commitment to help students make wise food choices. The addition of salad bar selections and nutritious snack foods to the school food service program also support nutrition education in the classroom. Finally, it is critically important that school personnel serve as role models by making wise food choices themselves.

Through scientific and clinical research, much has been learned about the nutritional needs of children and adolescents; however, this knowledge must be interpreted and applied to their lives in order for the full potential of nutrition education to be accomplished.

CULTURAL AWARENESS

The *ESR IV* curriculum guide contains additional teacher resource information entitled, "Cultural Awareness." These units are found at the beginning of each appropriate grade-level section and describe the influences of different cultural groups on the people of Texas.

Beginning with prekindergarten and continuing through the eighth grade, the "Cultural Awareness" sections summarize the influence of Native American, Mexican-American, African-American, German, Czech, Polish, French, Irish, Italian, Middle Eastern, and Asian-American cultures on Texas civilization. Detailed information concerning the food habits, lifestyles, folkways, and celebrations of these varied cultures is discussed in these units. The unit that precedes each grade-level section corresponds with the cultural group that is to be emphasized at each grade level.

The *ESR IV* curriculum for high school students emphasizes diet-related diseases, prevention techniques, and current nutrition issues rather than a specific culture; however, *ESR IV* social studies lessons for high school students incorporate cultural information that correlates with the high school social studies curriculum.

The "Cultural Awareness" resource information is a valuable teaching tool and resource for teachers using the *ESR IV* lesson plans.

THE INTERACTION OF NUTRITION EDUCATION WITH SCHOOL FOOD SERVICE

School food service has a major impact on the eating patterns of many school-age children. The school food service program gives students an opportunity to practice what is learned about eating for good health. Common to all school districts is the large number of children who depend on the School Lunch and School Breakfast Programs for the major nutritional contributions to their daily diet. The *ESR IV: Nutrition Education* curriculum includes lessons at all grade levels that directly correlate with the school food service programs and involve instructional strategies based on balanced meals served in the school cafeteria.

The *ESR IV* lessons that specifically correlate with school food service are identified with a school food service icon. These lessons contain learning activities that involve the cafeteria manager, the school food service menus, and the foods served in the school cafeteria as teaching aids in nutrition.

A cooperative effort of school food service personnel, teachers, and administrators to promote nutrition education can greatly impact the primary goal of improved nutrition for all school-age children.

The National School Lunch Program

Over one hundred years of development, testing, evaluation, and research have resulted in the effective school food service programs available to American school children today. Although school food service programs in this country can be traced back to the 1890s, European countries such as Germany, France, England, Holland, Switzerland, Italy, Sweden, and Norway all had school feeding programs dating back to the 18th century.

The first school feeding programs in the United States began with sporadic food services undertaken by private societies and associations that were interested in child welfare and education. The depression years of the 1930s deepened the concern over hunger and malnourishment among school children. Many states and municipalities adopted legislation to enable schools to serve noonday meals to their children. In 1932 and 1933, the Reconstruction Finance Corporation granted loans to several towns in southwestern Missouri to cover the cost of the labor needed to prepare and serve school lunches. Such federal assistance was expanded to 39 states in 1933 and 1934 under the operations of the Civil Works Administration and the Federal Emergency Relief Administration. In 1935, Congress provided that surplus agricultural commodities be donated for the school lunch program.

During World War II, nearly one-third of the young men turned down for military service were rejected due to nutritional deficiencies. This led to the passage of the National School Lunch Act in 1946 which permanently established school lunch as an integral part of the school system.

Today, the school lunch program is governed by the U.S. Department of Agriculture and State Department of Education regulations as well as local board of education policies.

Lunch Patterns

The goal of the National School Lunch Program is to safeguard the health and well-being of our nation's children. Meals served in the National School Lunch Program (NSLP) should be nutritious and well-balanced. The meal patterns required by the NSLP regulations are designed to provide children with approximately one third of the nutrients they need according to the Recommended Dietary Allowances for their age group.

A school lunch consists of five different food items from four food component groups. The four components include:

- meat/meat alternate
- bread/bread alternate
- vegetable/fruit
- fluid milk

Schools must provide two servings of different vegetables/fruits and one food item from each of the other three component groups. The recommended serving portion of each component can be found in the School Lunch Patterns chart found in the appendices. The important role that school food service plays in the nutritional health of children prompted the development of revised USDA recipes to reflect reduced fat, sugar, and salt in school meals.

The School Breakfast Pattern

The School Breakfast Program began under the Child Nutrition Act of 1966. It was originally a pilot project intended for indigent areas and regions where children had to travel a great distance to school. In 1975, legislation made the School Breakfast Program available to all areas.

School breakfast must include:

- fluid milk
- vegetable/fruit or full strength juice
- two servings of bread/bread alternate or meat/meat alternate or a combination of one bread/bread alternate and one meat/meat alternate

The recommended serving portion of each component can be found in the School Breakfast Pattern chart in the appendices.

Major Nutrients Supplied By School Meals

Children and teenagers require nutrients for growth and maintenance of body size and functions, and school meals are designed to provide these major nutrient contributions. The following nutrients are supplied through foods served daily in school food service programs:

- **Meats or Meat Alternates**
  - protein
  - iron
  - thiamin, riboflavin, niacin, B_6 (pyridoxine)
  - B_{12} (cyanocobalamin)
  - magnesium
- **Vegetables and Fruits**
  - vitamin A (retinol)
  - vitamin C (ascorbic acid)
  - iron
  - magnesium
  - carbohydrate
  - folate
- **Breads and Bread Alternates**
  - B vitamins—thiamin, riboflavin, niacin
  - minerals
  - carbohydrate
- **Milk**
  - calcium
  - protein
  - vitamin A
  - vitamin D
  - riboflavin
  - magnesium
  - phosphorus
  - vitamin B12 (cyanocobalamin)

Offer vs. Serve Provision

The "offer vs. serve" provision is the regulation that allows senior high school students to choose fewer than all the food items within the breakfast and lunch pattern. Students in other grades may do this only if approved by the local school food authority. The regulation requires that students be "offered" four components, and students must choose at least three of these items for their meal to be reimbursable. Declining one or two items does not relieve students from paying the full price for the meal. Only the student may determine which items will be chosen or refused.

Adult Meals and Reimbursement

The benefits of the National School Lunch and Breakfast Programs were designed for children. The reimbursement and commodities received by schools are based on the number of lunches and breakfasts served to students. Although commodities are given to school districts, the district must still pay for storage, transportation, and production of the food. No reimbursement or commodities are provided for meals served to adults; therefore, the adult meal must reflect the actual cost of the meal production. Teachers are served food in the same quantities as specified for middle and high school students.

The School Lunch and School Breakfast Programs provide nutritious meals for American school children each day. Community and school district support of nutrition education and school food service programs is critical if children and adolescents are to be provided with the best opportunity for improved health and well-being.

PARENT INVOLVEMENT

Parental involvement is an important link to the overall success of a nutrition education program. There is a direct relationship between parents' involvement in student learning and the achievement of their children. Parents who take an active role in nutrition education can help their children make healthy eating patterns become a lifestyle habit.

Schools can encourage parental involvement in the nutrition education program by sponsoring parent awareness activities. Some suggested activities that can increase parent awareness of the nutrition education program at school include:

- scheduling PTA programs which educate parents about the *ESR IV* program and include tours of the food service facility

- holding an open house at school with a "tasting party" of the foods served in the School Lunch and School Breakfast Programs
- sending a letter to parents from the teacher and/or the student about the nutrition education program
- providing take-home menus of the school food service programs
- recruiting parent volunteers to assist with classroom activities involving food preparation, to serve as guest speakers for food industry careers, or to share knowledge of multicultural foods with students
- motivating parents to encourage their children to eat nutritious snacks that promote good health

It is the responsibility of school administrators, faculty, and staff to be the catalyst for parent involvement in nutrition education.

PROGRAM VISIBILITY

Students must be continually reminded of the role self-responsibility plays in achieving and maintaining optimal health through good nutrition. The use of posters, "Nutrition Month" (March) activities, and nutrition education emphasis throughout other school programs such as athletics, student councils, Future Educators of America, Future Farmers of America, and Future Homemakers of America can serve to reinforce the learning that takes place in the classroom.

The most powerful reinforcement in teaching good nutritional habits involves the administrators, teachers, school nurses, parents, and other adults as role models who make wise food choices for good health each day.

Implementing the ESR IV *Curriculum Guide*

Education for Self-Responsibility IV: Nutrition Education is a curriculum guide that allows teachers to incorporate important nutrition concepts into the existing course of study. Texas teachers, school nurses, administrators, school food service personnel, and other community health professionals provided valuable input into the development of the *ESR IV* curriculum guide. The challenges offered by our changing society have increased the need for nutrition education to become an integral part of basic education so that children and adolescents can develop self-responsibility for their own personal health and wellness.

The *ESR IV* guide contains three volumes of lesson plans and activities for prekindergarten through Grade 12 which are integrated across seven content areas. Within the guide are sample lesson plans and instructional activities that are correlated with Title 19, Chapter 75, Texas Administrative Code (State Board of Education rules for curriculum). The broad range of nutrition topics provides the teacher with opportunities to select and adapt the lessons into planned course work as well as expand and extend the instruction to include other appropriate essential elements.

The *ESR IV* guide was designed for use by the regular classroom teacher and other instructional staff members within the school. Persons other than the school's instructional staff such as dietitians and medical personnel should serve only in the role of guest speakers and resource persons, not as the teacher or instructional leader.

ESR IV GOALS

The goals for the *ESR IV: Nutrition Education* program include:

- to improve the nutritional health of school age youth through nutrition education and to prepare them for a lifetime of healthy dietary habits
- to develop a nutrition education curriculum guide based on behavioral and instructional objectives that are integrated into the content areas of fine arts, health, language arts, mathematics, science, social studies, and vocational education
- to design lesson plans and learning activities that correlate with the School Lunch and School Breakfast Programs. Learning

experiences should motivate students to apply new nutrition knowledge to the choices they make in the school cafeteria

- to increase student awareness and acceptance of the many cultures and cultural differences found in our world. Learning activities should allow students to analyze, compare, classify, categorize, and differentiate the food choices and dietary habits of people with cultural differences. Learning experiences should also integrate the nutritional value and importance of the dietary mainstays of people with various cultural backgrounds

ESR IV OBJECTIVES

The *ESR IV* objectives are written within a conceptual framework that encompasses the following areas:

- Basic Nutrition Principles
- Selecting A Balanced Diet
- Nutritional Needs During the Life Cycle
- Cultural Aspects of Food
- Nutrition Issues

Many behavioral and instructional objectives are written at each grade level to cover all of these areas within the framework. The instructional activities related to these objectives focus on areas of high interest for students and reflect current concerns in nutrition. The *ESR IV* curriculum empowers children and adolescents with the knowledge and skills needed to make wise food choices for the rest of their lives.

SCOPE AND SEQUENCE

The scope and sequence chart allows the user to see at a glance the overall objectives of the *ESR IV* curriculum for prekindergarten through Grade 12. Dots on the chart indicate the appropriate grade level for implementing each of the objectives.

/

SCOPE AND SEQUENCE

Prekindergarten through Grade Four

Goals:

- Improve the nutritional health of school-age youth through nutrition education and prepare them for a lifetime of healthy dietary habits.

- Motivate students to apply new nutrition knowledge to choices they make in the school cafeteria through School Breakfast and School Lunch Programs.

- Increase student awareness and acceptance of the many cultures and cultural differences in our world. Recognize the importance of the dietary mainstays of people with various cultural backgrounds.

A. Basic Nutrition Principles	PK	K	1	2	3	4
1. Identify food as the source of nutrients needed for growth, energy, and health.	●	●	●	●	●	
2. Identify different foods.	●	●				
3. Name the sources of food.	●	●	●			
4. Identify foods in different forms using all five senses.	●	●	●			
5. Explain the importance of safe handling of food.	●	●	●	●	●	●
6. Define the term *nutrients*.			●	●	●	
7. Explain the functions of nutrients.					●	
8. Describe the relationship of food to energy, growth, and health.						●
9. Identify the functions of nutrients as they relate to growth and health.						●
10. List the functions of dietary fiber in the body.						●
B. Selecting a Nutritionally Balanced Diet						
1. Make wise food choices as part of self-responsibility for health and wellness.	●	●	●	●	●	●
2. Make wise food choices at snack time.	●	●	●	●	●	●
3. Explain the importance of breakfast.	●	●	●	●	●	
4. Develop positive attitudes about food.	●	●				
5. Make wise food choices at mealtime.			●	●		
6. Explore new foods in each food group.			●	●	●	●
7. Classify foods using a food grouping system.				●	●	●
8. Make wise food choices using the daily food guide.					●	●
9. Select nutritionally balanced meals each day.					●	
10. Develop healthy eating habits.						●
11. Analyze daily food choices.						●

SCOPE AND SEQUENCE

Prekindergarten through Grade Four

C. Nutritional Needs During the Life Cycle	PK	K	1	2	3	4
1. Discuss nutritional needs of four, five, and six year olds.	•	•				
2. Discuss nutritional needs of six and seven year olds.			•			
3. Determine the results of unhealthy food habits.			•	•	•	
4. Discuss nutritional needs of seven and eight year olds.				•		
5. Discuss nutritional needs of eight and nine year olds.					•	
6. Discuss nutritional needs of nine and ten year olds.						•
7. Examine the effects of poor dietary habits.						•
D. Cultural Aspects of Food						
1. Investigate the customs of Native-American cultures.		•				
2. Discuss family food preferences.	•	•	•	•	•	•
3. Examine food traditions.	•	•	•	•	•	•
4. Investigate the customs of Mexican-American cultures.			•			
5. Develop an appreciation for foods from different cultural groups.			•	•	•	•
6. Explore food from different cultures.			•			
7. Investigate the customs of African-American cultures.				•		
8. Explore food from different cultures and categorize them using a food grouping system.				•	•	•
9. Analyze the customs of German, Czechoslovakian, and Polish cultures.					•	
10. Analyze the customs of French, Irish, and Italian cultures.						•
E. Nutrition Issues						
1. Explain the role of nutrition and physical fitness in maintaining good health.	•	•	•	•	•	•
2. Identify basic nutrition information on food labels.					•	•
3. Discuss wise consumer food-buying skills.					•	•

SCOPE AND SEQUENCE

Grade Five through Grade Eight

Goals:

- Improve the nutritional health of school-age youth through nutrition education, and prepare them for a lifetime of healthy dietary habits.
- Motivate students to apply new nutrition knowledge to choices they make in the school cafeteria through School Breakfast and School Lunch Programs.
- Increase student awareness and acceptance of the many cultures and cultural differences in our world. Recognize the importance of the dietary mainstays of people with various cultural backgrounds.

A. Basic Nutrition Principles	**5**	**6**	**7**	**8**
1. Describe the relationship of food to energy, growth, and health.	•	•		
2. Identify the functions of nutrients as they relate to growth and health.	•	•		
3. Distinguish between nutrition facts and fallacies.	•	•	•	•
4. List the functions of dietary fiber in the body.	•	•	•	•
5. Recognize the effects of food on health and appearance.	•	•	•	•
6. Explain the importance of safe handling of food.	•	•		
7. Explain the physiological, psychological, and social implications of food.			•	•
8. Identify nutrients, their sources, and their functions.			•	•
9. Compare the nutritive value of foods.			•	•
10. Discuss the Dietary Guidelines for Americans.			•	•
11. Identify the factors involved in preventing food-borne illness.			•	•
B. Selecting a Nutritionally Balanced Diet				
1. Make wise food choices as part of self-responsibility for health and wellness.	•	•	•	•
2. Make wise food choices using the pattern for daily food choices.	•	•		
3. Make wise food choices when eating away from home.	•	•	•	•
4. Make wise food choices at snack time.	•	•	•	•
5. Classify foods using a food grouping system.	•	•		
6. Illustrate ways to avoid excess cholesterol, fat, salt, and sugar.	•	•		
7. Explore the influence of food advertising and the media on food habits.	•	•	•	•
8. Analyze personal food habits.			•	•
9. Determine the effects of peer pressure on food choices.			•	•

SCOPE AND SEQUENCE

Grade Five through Grade Eight

C. Nutritional Needs During the Life Cycle	**5**	**6**	**7**	**8**
1. Discuss nutritional needs of the pre-adolescent and the adolescent.	•	•		
2. Examine the effects of poor dietary habits.	•	•		
3. Discuss nutritional needs of adolescents.			•	•
4. Discuss ways to achieve a low-fat diet.			•	•
5. Explain the relationship of high intakes of sodium to hypertension.			•	•
6. Examine ways to reduce intake of cholesterol.			•	•
7. List strategies for reducing the amount of sugar in the diet.			•	•
8. Evaluate dietary needs of women during pregnancy and lactation.			•	•
9. Describe the relationship between nutrition and the prevention and treatment of health problems (cancer, common cold, diabetes, heart disease, PKU).			•	•
D. Cultural Aspects of Food				
1. Investigate the customs of Middle Eastern cultures.	•			
2. Investigate the customs of Asian cultures.		•		
3. Discuss family food preferences.	•	•	•	•
4. Examine food traditions.	•	•	•	•
5. Develop an appreciation for foods from different cultural groups.	•	•		
6. Examine the influence of other cultures on our current food habits.	•	•		
7. Analyze the cultural and social aspects of food.	•	•		
8. Explore the development of attitudes toward food.	•	•		
9. Analyze the customs of early Texas settlers.			•	•
10. Develop an understanding of cultural food differences.			•	•
11. Investigate cultural influence on food in Texas.			•	•
E. Nutrition Issues				
1. Explain the role of nutrition and physical fitness in maintaining good health.	•	•	•	•
2. Analyze nutrition information on food labels.	•	•	•	•
3. Identify various eating disorders and their symptoms.	•	•		
4. Distinguish between reliable and unreliable sources of nutrition information.	•	•	•	•
5. Discuss wise consumer food-buying skills.	•	•	•	•
6. Determine the relationship between nutrition and weight control.			•	•
7. Evaluate the claims made by promoters of fad diets.			•	•
8. Describe various eating disorders and their symptoms.			•	•
9. Investigate new developments in food trends.			•	•

SCOPE AND SEQUENCE

Grade Nine through Grade Twelve

Goals:

- Improve the nutritional health of school-age youth through nutrition education, and prepare them for a lifetime of healthy dietary habits.
- Motivate students to apply new nutrition knowledge to choices they make in the school cafeteria through School Breakfast and School Lunch Programs.
- Increase student awareness and acceptance of the many cultures and cultural differences in our world. Recognize the importance of the dietary mainstays of people with various cultural backgrounds.

A. Basic Nutrition Principles	9	10	11	12
1. Define the term *nutrition*.	•	•	•	•
2. Explain the physiological, psychological, and social implications of food.	•	•	•	•
3. Identify nutrients, their sources, and their functions.	•	•	•	•
4. Compare the nutritive value of foods.	•	•	•	•
5. Distinguish between nutrition facts and fallacies.	•	•	•	•
6. List the functions of dietary fiber in the body.	•	•	•	•
7. Discuss the Dietary Guidelines for Americans.	•	•	•	•
8. Analyze the relationship between nutrition, health, and wellness.	•	•	•	•
9. Recognize the effects of food on health and appearance.	•	•	•	•
10. Analyze the factors involved in preventing food-borne illness.	•	•	•	•
11. Outline methods for retaining nutrients in foods.	•	•	•	•
B. Selecting a Nutritionally Balanced Diet				
1. Make wise food choices as part of self-responsibility for health and wellness.	•	•	•	•
2. Make wise food choices when eating away from home.	•	•	•	•
3. Make wise food choices at snack time.	•	•	•	•
4. Analyze personal food habits.	•	•	•	•
5. Determine the effects of peer pressure on food choices.	•	•	•	•
6. Explore the influence of food advertising and the media on food habits.	•	•	•	•
7. Examine eating patterns from the past and predict the future.	•	•	•	•

SCOPE AND SEQUENCE

Grade Nine through Grade Twelve

C. Nutritional Needs During the Life Cycle	9	10	11	12
1. Describe nutritional needs throughout the life cycle.	•	•	•	•
2. Discuss ways to achieve a low-fat diet.	•	•	•	•
3. Explain the relationship of high intakes of sodium to hypertension.	•	•	•	•
4. Examine ways to reduce intake of cholesterol.	•	•	•	•
5. List strategies for reducing the amount of sugar in the diet.	•	•	•	•
6. Evaluate dietary needs of women during pregnancy and lactation.	•	•	•	•
7. Describe the relationship between nutrition and the prevention and treatment of health problems (cancer, common cold, diabetes, heart disease, PKU).	•	•	•	•
D. Cultural Aspects of Food				
1. Discuss family food preferences.	•	•	•	•
2. Examine food traditions at home and around the world.	•	•	•	•
3. Discuss factors affecting the world food supply.	•	•	•	•
E. Nutrition Issues				
1. Explain the role of nutrition and physical fitness in maintaining good health.	•	•	•	•
2. Determine the relationship between nutrition and weight control.	•	•	•	•
3. Evaluate the claims made by promoters of fad diets.	•	•	•	•
4. Analyze the problems and symptoms associated with various eating disorders.	•	•	•	•
5. Analyze nutrition information on food labels.	•	•	•	•
6. Distinguish between reliable and unreliable sources of nutrition information.	•	•	•	•
7. Investigate new developments in food trends.	•	•	•	•
8. Discuss wise consumer food-buying skills.	•	•	•	•
9. Analyze the economics of good nutrition.	•	•	•	•
10. Investigate claims concerning natural and organic foods.	•	•	•	•
11. Assess the role of vitamin and mineral supplements.	•	•	•	•
12. Review current events in the field of nutrition.	•	•	•	•

ORGANIZATION OF ESR IV

ESR IV is divided into three volumes that are designated for prekindergarten - Grade 4, Grades 5 - 8, and Grades 9 - 12. Each volume stands alone for distribution to appropriate school personnel. Each of three volumes are divided into the following sections: (1) introductory materials, (2) sample lessons, and (3) resources.

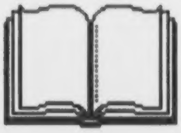
The introductory materials are at the beginning of each volume and contain useful information for implementing a nutrition education program such as goals, objectives, scope and sequence, and cultural awareness. It also includes an Instructor's Resource Guide for Teaching Nutrition Education which provides teachers with the background nutrition information they need to feel comfortable teaching the *ESR IV* lessons. Sample lesson plans follow the introductory materials in each volume. These lessons are appropriate to each grade level and have corresponding student worksheets, handouts, teacher resource pages, and transparency masters. At the end of each volume is a collection of resources for the teacher to use with the lesson plans.

The sample lessons are arranged by grade level beginning with prekindergarten and ending with high school. The suggested subject areas are identified by an icon in the upper right-hand corner of each page. The lessons that contain the school food service icon in the lower right-hand corner are specifically designed to include activities to correlate with the school food service programs.

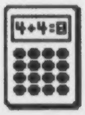
Icons for the *ESR IV* sample lessons include:

Fine Arts

Health



Language Arts



Mathematics

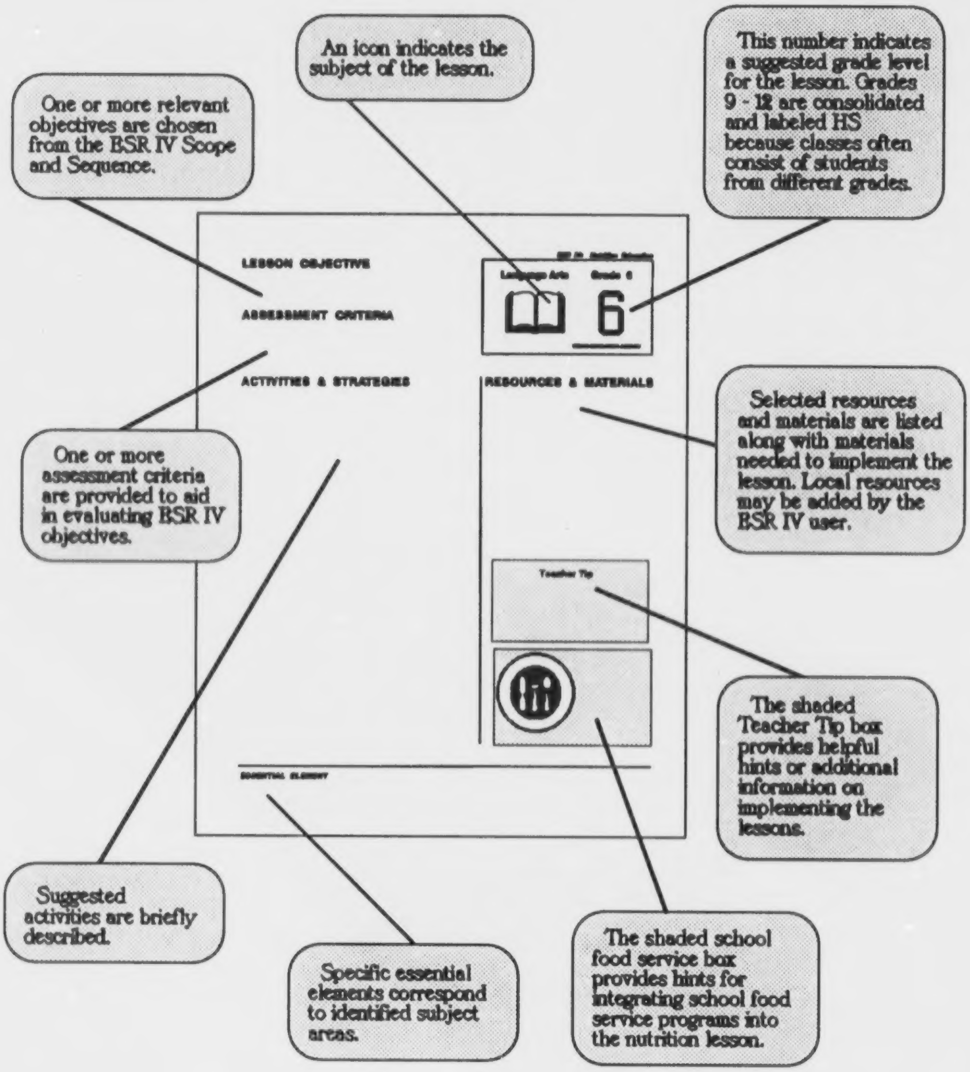
Science

Social Studies

Vocational Education

School Food Service

USING THE ESR IV LESSONS


LESSON OBJECTIVE
ASSESSMENT CRITERIA
ACTIVITIES & STRATEGIES
Language Arts
Grade 6
6
RESOURCES & MATERIALS
Teacher Tip
ESSENTIAL ELEMENT

One or more relevant objectives are chosen from the BSR IV Scope and Sequence.

An icon indicates the subject of the lesson.

This number indicates a suggested grade level for the lesson. Grades 9 - 12 are consolidated and labeled HS because classes often consist of students from different grades.

One or more assessment criteria are provided to aid in evaluating BSR IV objectives.

Selected resources and materials are listed along with materials needed to implement the lesson. Local resources may be added by the BSR IV user.

The shaded Teacher Tip box provides helpful hints or additional information on implementing the lessons.

Suggested activities are briefly described.

Specific essential elements correspond to identified subject areas.

The shaded school food service box provides hints for integrating school food service programs into the nutrition lesson.

RESOURCES

Appendices at the end of each volume of the curriculum guide include:

- *Suggested Teacher Resources* containing books, government documents, pamphlets, periodicals, and audiovisuals
- *Bibliography* of nutrition education publications
- *A Pattern for Daily Food Choices* consisting of a daily food guide chart based on the USDA 's "Dietary Guidelines for Americans"
- *Recommended Dietary Allowances* established by the National Food and Nutrition Board of the National Academy of Sciences
- *Food Composition Table* consisting of a list of the nutrient composition of selected food items
- *Dietary Guidelines for Americans* adapted from "Nutrition and Your Health: Dietary Guidelines for Americans," U.S.Department of Agriculture and U.S. Department of Health and Human Services
- *Glossary of Terms*
- *Suggested Instructional Strategies*
- *Health Hotline of Agencies and Organizations* containing a list of agencies and organizations that provide nutrition education information and materials

TRAINING

An important aspect of any curriculum implementation is the training of those who will be involved as teachers and leaders of the nutrition education program. Due to increased public interest in nutrition, much of the media attention given to the subject has been misinformation or fallacy; therefore, it is imperative that those educators who use the *ESR IV: Nutrition Education* curriculum need to have accurate nutrition information. The following school personnel can be trained to use or train others to use the *ESR IV* nutrition education curriculum:

- school board members
- administrators (including athletic directors)
- faculty members (including all teachers and coaches)
- school nurses, counselors, and librarians
- school food service personnel

The training program for all school personnel should address the following issues:

- the importance of providing factual nutrition information based on scientific and clinical research

- the school's role in implementing nutrition education as a part of each child's basic education
- the effects of poor nutritional habits on school performance
- the role of school food service programs in the total nutrition education program
- the importance of community support and parental involvement

The teachers and instructional staff members responsible for instructing nutrition education should receive additional training in the following areas:

- basic nutrition principles
- nutrition education as an integral part of each child's basic education
- explanation of an integrated curriculum
- philosophical framework of *ESR IV* (Behavioral, emotional, intellectual, and physical growth depends on healthy dietary habits.)
- team teaching the nutrition education curriculum
- organization of the curriculum guide including the purpose of combining information, skills, and support
- specific instructions on how teachers can use the curriculum guide including illustrations of a variety of instructional techniques
- skills in lesson closure to reinforce the message that eating for good health must become a lifestyle habit
- descriptions of a variety of evaluation techniques for gauging the effectiveness of instruction

RED FLAGS

It is important that the teacher acknowledge the differences in individuals and their health needs to help reduce self-consciousness during the nutrition lessons. This communication reassures each student that he or she is a unique person; however, nutrition education specialists have identified some sensitive issues and actions that should be noted when teaching nutrition education. Issues or actions that should be avoided are called red flags and include:

Making comments about personal likes and dislikes in reference to foods
Children see teachers and other adults as role models and tend to copy their behavior. Set a good example for the students by making wise food choices.

Classifying foods as "good" or "bad"
Children will develop healthy attitudes about eating if they are taught that all foods can fit into a healthy diet when eaten in moderation. Eating can be a pleasurable experience for everyone.

Engaging in teacher self-disclosure
Teachers and students should not be encouraged to share personal stories relating to weight loss programs, fad diets, eating disorders, etc. Discussions should center around factual nutrition information and developing valuable life skills.

Discussing prescribed diets and personal food preferences
Children and adults consider their food habits to be very personal, and self-esteem can be easily damaged. Discussions of prescribed diets may encourage experimentation.

Making negative references to meals eaten in the school cafeteria
Mealtime is a significant part of every person's day. Allow children to view meals eaten at school as positive, social experiences.

Handling disciplinary problems during mealtime in the school cafeteria
It is important to remove the child to another location for disciplinary action. This will benefit the child causing the problems as well as the other children who develop anxiety from witnessing the disciplinary action. Anxiety during mealtime causes loss of appetite and stomach distress.

Making comments that reinforce the unrealistic societal demand for perfect people with perfect bodies as seen through the media
It is imperative that positive messages of respect and value for each individual's unique qualities and talent replace negative messages produced in television, film, radio, music, newspapers, and magazines.

Encouraging the use of vitamin and mineral supplements
Young people who are active in athletic programs are vulnerable to advertising promises that certain supplements and protein powders will improve athletic performance and increase stamina and strength. Physically active children and teens need to increase their intake of nutrients only slightly, and these needs can easily be met by the addition of several nutritious snacks during the day. Young athletes need a high carbohydrate diet which includes plenty of fruits,

vegetables, grains, and starches as well as adequate calories and fluids. Megadoses of vitamin and mineral supplements are potentially harmful and can cause serious side effects.

RECOMMENDATIONS FOR USING ESR IV

When planning the implementation of *ESR IV* for the classroom, the first step is to familiarize yourself with the philosophy pertaining to nutrition education in the curriculum guide and in district and campus-level plans.

The recommended procedure for using *ESR IV* is as follows:

- Obtain a copy of the "Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of each volume of *ESR IV*. **It is imperative that each teacher have a personal copy of the "Instructor's Resource Guide for Teaching Nutrition Education."** Many of the lessons depend on this resource as a teaching aid.
- Read through the introductory section to gain a broad understanding of Texas' overall effort to improve the nutritional health of Texas school children.
- Scan the sample lessons and resources to familiarize yourself with lesson content.
- Identify any personal weaknesses in preparation for teaching nutrition education and initiate plans to strengthen skills and knowledge in those areas.
- Develop a plan of implementation by consulting with teachers of all grade levels and building grade-level files. Such plans will contribute to the continuity of students' experiences from grade to grade.
- Plan your lessons. Based on the characteristics of your class, the materials available to you, and your personal judgment, select the lessons and activities you will teach.
- Understand that the lessons may have one or more activities which may take varying amounts of time. All activities on a sample lesson page do not need to be completed in one lesson period.
- Arrange for any additional materials needed to conduct the lessons.
- Teach nutrition education as an integral part of your regular class.
- Involve the school librarian in screening and selecting materials.

USING OTHER CURRICULAR MATERIALS

ESR IV is a nutrition education curriculum intended to supplement and enhance the total education of Texas school-age children. The nutrition information found in *ESR IV* is based on current health research. It is important that the nutrition facts presented to students throughout the curriculum be consistent and correct. Some criteria to consider when selecting additional nutrition education curricular materials include:

- Do the materials clearly supplement the existing curriculum? New curriculum materials should integrate easily into the overall academic program.

- Do the materials begin with early childhood and carry through to high school? In order to establish healthy eating habits and modify unhealthy current eating practices, nutrition education must begin early in a child's life and continue through all stages of the life cycle.

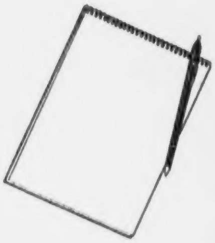
- Do the materials fit into the comprehensive health program? A comprehensive health program includes health education in the classroom, health services provided by the school nurse, and a healthy school environment.

- Are the materials culturally sensitive? Public schools serve students from diverse cultures. The variety of student backgrounds and traditions in the classroom must be considered.

- Are the materials founded on valid research? Consider using only materials and activities that are based on current nutrition research.

- Do the materials have current, state-of-the-art information? Out-of-date nutrition information resources and materials in the classroom and the library must not be used and should be removed.

EVALUATION



Evaluation is an essential part of any teaching and learning program. The educational process provides students with opportunities to master content, develop thinking skills, master skills needed to perform tasks, and change attitudes and behaviors based on new learning. In comparison, the evaluation process provides educators with opportunities to:

- confirm the hypotheses that served as the basis for the program plans
- examine strengths and weaknesses of the program
- draw conclusions based on the program's strengths and weaknesses
- analyze data that will substantiate future decisions concerning improvements to the program
- make decisions concerning recommended revisions

The ongoing evaluation process should occur at all levels from the classroom to the school campus, the school district, and the state agency. Evaluation involves asking critical questions that will supply the data necessary to determine the effectiveness of the learning. There are several steps involved in the evaluation process which include:

1) formulating clearly defined instructional objectives
2) gathering of evidence that acknowledges the achievement of the stated objectives
3) analyzing and interpreting the evidence
4) assessing the strengths and weaknesses of the students
5) proposing modifications and improvements to the total program

Evaluation of a program such as *ESR IV* may differ from the evaluation of other curriculums that involve mainly cognitive and psychomotor learning. The *ESR IV* goals "to improve the nutritional health of school age youth through nutrition education and to prepare them for a lifetime of healthy dietary habits" involve the affective outcomes of changed attitudes and behaviors. Significant emphasis must be placed on the role that values and attitudes play concerning food, food habits, health, and wellness. Evaluation methods such as anonymous self-reporting instruments and observation techniques may provide a truer assessment of changed behaviors and attitudes than written tests or other more traditional evaluation tools.

Key questions to be addressed in the evaluation of the *ESR IV: Nutrition Education* curriculum include:

- What percentage of the intended student audience is being reached?
- How effective is the program in meeting the identified goals and objectives?
- Is the program integrity maintained?
- What improvements could be made to ensure that students obtain the maximum benefit from the program?
- Are teachers integrating the lessons into the subject matter areas as designed?

Questions that assess changed student behaviors and attitudes include:

- Do students understand the relationship of good nutrition to health and wellness?
- Do students recognize that there are not "junk foods", but only "junk diets?"
- Have students developed skills to make wise food choices and to develop healthy dietary habits?
- Do students have a clear understanding of "making wise food choices?"
- Are students able to analyze their own personal eating habits?
- Can students relate how nutritional needs change throughout all stages of the life cycle?
- Do students have an increased awareness of cultural differences and cultural dietary practices?
- Have students learned to cope with stress from home, school, and work in ways other than binge eating?
- Can students explain why there is no "miracle food?"
- Are students able to discuss the relationship between a healthy self-image and their food choices?
- Do students realize that exercise and sufficient rest must be combined with nutritional dietary practices to improve the quality of life at any age?

Evaluation is a comprehensive, cooperative, and continuous process. It is comprehensive when all learning and all objectives are evaluated regardless of their level of difficulty. The cooperative process involves the combined efforts of teachers, administrators, and other personnel toward evaluation. This "cooperative spirit" allows for a true evaluation of the program's effectiveness. Finally, evaluation must be a continuous process because inevitable change and revision bring about the need for new evaluation. Continual evaluation and improvement of any program is the key to its success.

Modifying ESR IV for Special Populations

The nutritional health of school-age children of all races and socioeconomic levels is an ongoing concern for educators and health professionals. All students who are capable of learning and understanding should be taught the skills necessary to develop a lifestyle of healthy dietary habits. Nutrition education concepts, skills, and objectives should be mastered just as other educational concepts and objectives are mastered.

Special populations include students who:

- have handicaps
- have academic difficulty
- are bilingual
- possess limited English proficiency
- are from migrant families
- are gifted and talented

Despite their differences, these students have a common need for alternative approaches to instruction in the classroom because regular classroom teaching strategies are generally inadequate for them.

A major goal of any education program is to provide all students with opportunities to advance to the full extent of their abilities. The state-mandated curriculum now ensures a well-balanced single curriculum of instruction for all students regardless of special need or condition. Instruction for students with special needs includes the same essential elements as instruction given to general education students. Special program personnel and regular instructional personnel are jointly responsible for the cooperative yet modified delivery of effective instruction to students with special needs.

SPECIAL EDUCATION

Handicapped students may be able to fulfill the same curriculum requirements as their nonhandicapped peers; however, they may require modified content, testing methods, instructional methods, materials, pacing, and other attention regarding nutrition education.

Mainstreamed special education students may not have any background health information if they have not had classes such as health, physical education, and science which include essential elements related to health and nutrition. Class schedules of special education students and their Individual Education Plans (IEP) should be monitored to assure that these students are receiving adequate nutrition education.

Educators should be sensitive to the needs of handicapped students who rely on medicines and life support mechanisms. These students must not be made to feel that something is wrong with them because of their dependence on the medications or machines. Many handicapped students also have special dietary needs which should be recognized with care and sensitivity.

It is important to modify methods of presenting *ESR IV* materials to students with special needs. The teacher can select activities that make use of posters, charts, drawings, and flannelboard designs instead of teaching activities that require reading skills. Instruction can be delivered to hearing impaired students through sign language and to the severely visually handicapped through Braille. If students have handicaps that impair judgment, a direct instructional approach may be best.

Complex lessons with special vocabulary, complicated language patterns, or difficult illustrations should be avoided. Other possible modifications include:

- supply supportive instruction and reinforcement while using the same materials as for nonhandicapped students
- provide special instructional materials or media to reinforce concepts presented in nonhandicapped classes
- furnish adaptive methods to assess a student's knowledge of the subject area or essential elements in the standard courses
- summarize key points before starting an assignment
- match the content and delivery with the developmental level of the learner
- give instructions through several channels such as written and oral demonstration
- repeat instructions; provide more detailed directions
- change the pace of presentation
- ask leading questions as work progresses
- use progress charts and informal individual feedback interviews
- assign oral presentations, reports, and projects
- allow more time for assignments
- establish a buddy system within the classroom to provide assistance
- use peer tutors to assist handicapped students

- use group assignments
- use tape-recorded material so that students can listen and follow along in the written text; record instructions and assignments

COMPENSATORY EDUCATION

Compensatory instruction is targeted for students who are having academic difficulty in English language arts, mathematics, science, and social studies. Other students who may require remedial or compensatory instruction include migrant students, students whose primary language is not English, and prekindergarten or kindergarten children who have been identified as having developmental needs.

Compensatory instruction should extend and reinforce the regular program of instruction. Instruction in nutrition education for students in this category should be:

- based on each student's functional instructional level
- modified as necessary to accommodate methodologies, pacing, and materials
- designed to include the essential elements

Some students in this category may need assistance with a single concept or skill while others may be functioning significantly below the age or grade level of their peers and therefore require more attention. Teachers of students with special needs should:

- identify specific skill needs to ensure that instruction is directed toward specific skill and concept deficits
- identify specific learning modalities and styles
- identify alternate instructional strategies
- compare appropriateness of the material and activities with the student's reading and maturity level

Special remedial and compensatory alternatives are available such as tutorials, special teachers to provide additional time on task, reading improvement courses, locally developed study skills courses, coaching, summer school, and counseling. The regular teacher and any other teacher who provides remedial or compensatory instruction in addition to regular classroom instruction should plan and coordinate instructional activities using a team approach. Instructional personnel should also have training in teaching nutrition education. Regular instructional personnel and special personnel involved in the compensatory education program should work together to apply the same principles in nutrition instruction as in other teaching. To be effective, the educators will:

- determine each student's instructional level and identify specific skill needs
- jointly design and implement lesson plans
- adapt or modify instruction based on continuous assessment of student progress
- use small group instruction for students with the same skill needs
- limit independent activities to shorter periods of time
- ensure close monitoring of practice activities to prevent repetition of misunderstandings
- use concrete activities to teach skills and concepts
- use cross-age tutors, adult tutors, and peer tutors for one-on-one reinforcement
- arrange for adult coaches who can serve as mentors

BILINGUAL EDUCATION

To ensure that the goals of *ESR IV* are met for limited English proficient (LEP) students, administrators, and teachers must design a program equivalent to the program provided for native speakers. LEP students must have the opportunity to learn and use materials that develop expanded meanings of language, build vocabulary, and teach word recognition and comprehension techniques. To prevent feelings of isolation and low self-esteem that may result from a lack of proficiency in English, students should also be given frequent opportunities to participate in nutrition education activities provided at the school and in the community. These activities can lead the students to experience success and consequently improve their self-esteem and physical health and well-being.

Teachers who are certified as bilingual or English as a Second Language (ESL) instructors can team with personnel on emergency teaching permits to develop supplementary programs for LEP students. Parent volunteers and paraprofessionals can work with regular instructional personnel cooperatively to deliver the needed programs.

While modification of the instructional program involves changing the language in which the content is conveyed, the scope of the curriculum should remain the same. In an ESL program, the sequence in which the essential elements are presented can be modified to accommodate students' progress in acquiring English language skills. Emphasis on oral and visual stimuli aids students in grasping the concepts that English-speaking students develop by writing.

More specifically, the teacher can help students build card files and glossaries on nutrition vocabulary, present the same information through a variety of different charts and visuals, encourage students to underline key words or important facts in their written assignments, and encourage categorizing of nutrition words and information into meaningful groups. Teachers can also pair students for team learning.

In an ESL program, pacing modifications should be based on vocabulary concept development while in a bilingual program, dual language instruction enables teachers to use a process approach to the content area. Additionally, teachers can explain special vocabulary terms in the students' native language; write instructions using short, simple sentences; limit the number of problems that must be worked; record activities for independent listening assignments; de-emphasize speed and emphasize accuracy of work; ask open-ended questions to allow practice in thinking and speaking; and assign homework tasks that require a short reading time. Teachers also need to remember that the students' parents or families may not speak English or have few materials at home to support learning activities.

It is important that student materials, whether they are state-adopted textbooks in Spanish, teacher-made lessons, or district-developed aids to instruction, be modified to meet the students' academic needs. The teacher can modify student materials and activities by:

- providing pictures to illustrate new words
- offering a variety of reference materials at the students' instructional levels for independent work
- using a variety of activities from lower grade levels such as games to be played by pairs of student or small groups
- maintaining a library of supplementary books and workbooks written in simple English
- using diagrams and drawings to identify concepts and relationships
- providing films, records, filmstrips, and videotapes to be used independently or in small groups

MIGRANT STUDENTS

Effective teaching of migrant students is a challenge for many districts and individual schools. Thorough, careful analysis and diagnosis are needed to determine if migrant needs are due to lack of experience, lack of time on task, or need for remediation. An accurate assessment is essential in order to adapt the content of the curriculum, methods of instruction, and the direction of nutrition education to meet migrant students' needs.

Migrant students are often limited in English proficiency, require compensatory and remedial assistance, or need enrichment activities to be challenged adequately. Sometimes, these students also attend school part-time, from six to seven months, or they may attend school for the full year. In either situation, gaps in their education are usually apparent.

Teachers can extract vital educational information concerning individual migrant students from the Migrant Student Record Transfer System (MSRTS) which reports credits earned in courses and partial work completed. If migrant counselors are available, they can assist teachers in planning instructional programs for migrant students. Continuity of instruction and provision of intensive remediation are two important ways in which teachers can provide an opportunity for migrant students to learn the essential elements. School districts can share information by using a checklist indicating which essential elements have been taught, which need to be reinforced, and which require further instruction.

The following list suggests ways that teachers can modify *ESR IV* for migrant students:

- Assess the students' instructional levels through informal testing.
- Select and highlight the most important activities that help explain and give vocabulary to the essential elements.
- Prepare brief outlines of units to be studied and highlight important topics related to nutrition education.
- Build independent units for elementary students that can be rearranged as needed to cover areas that the students have not been taught.
- Establish a buddy system for recording and reporting data and for completing assignments.
- Provide migrant students with oral tests and/or tape-recorded lessons when appropriate.

- Use a group language experience approach for oral language development.
- Allow the students to bring their own culture into the classroom by incorporating it into the content of the course.
- Capitalize on students' experiences of travel, work, and different family structures.
- Provide mentors for gifted migrant students who show ability and interest in a certain field, especially in nutrition and health-related careers.
- Assign homework and course projects that are relevant to the migrant student.
- Allow opportunities for independent work that can be completed through prepared independent units of study.
- Use tutors to supplement instruction; keep student/teacher, aide, or peer ratio low.
- Establish extra classes in the evening, on weekends, and during the summer.
- Provide computer-assisted instruction for remedial and enrichment purposes.
- Assess facets of the students' migrant experience that can help them grasp and master certain essential elements.
- Modify textbook and other reading passages to an appropriate reading level.
- Make use of high-interest, low-reading level materials.

Educators may also use suggestions from the Compensatory Education, Bilingual Education, and Gifted and Talented Education sections of this curriculum guide to plan an effective instructional program for migrant students.

GIFTED AND TALENTED STUDENTS

An understanding of the needs and characteristics of gifted and talented students is the first step in adapting the *ESR IV* curriculum guide for these students. Programs for gifted students modify or differentiate the curriculum used in the standard classroom regardless of content area. This does not imply that the curriculum is different, but rather that it accelerates, expands, or enriches the regular curriculum to suit the needs of the gifted learner. This is in keeping with Title 19, Chapter 75 of the Texas Administrative Code, which suggests that districts use these techniques when modifying the curriculum for gifted students.

Differentiation of the curriculum takes place in three areas. A differentiated curriculum contains in-depth content studies which are joined with sophisticated process skill development to result in sophisticated product development.

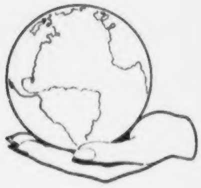
Differentiation of the nutrition education curriculum can be effective in every subject or course area and at all grade levels. Gifted students should first be involved at the knowledge level. The importance of establishing a lifetime of healthy dietary habits can be taught through direct instruction and through films, books, pamphlets, periodicals, and resource individuals. At the appropriate time, administrators and teachers can accelerate, expand, and enrich the program by including activities that encourage students to:

- apply critical thinking and analysis skills to writing questions related to nutrition for a unit of study using Bloom's taxonomy
- sharpen creative thinking and communication skills by creating plays, poems, ads, slogans, posters, stories, and books for nutrition education strategies and activities
- apply knowledge of nutrition education by preparing brainteasers and puzzles to be used in a puzzle book for other students
- plan and present an assembly about nutrition using songs, skits, poems, and choral readings that they have developed
- increase research skills by having students choose a topic related to nutrition, state a thesis, conduct research, and then present findings in the form of a creative display or product
- develop leadership skills by planning and producing a nutrition education campaign or assembly for preschool or elementary children
- develop an independent study project focusing on a topic related to nutrition

Other modified or differentiated activities for gifted students can include:

- designing and setting up a learning center related to nutrition education
- planning, scheduling, and providing follow-up activities for an in-class presentation by a dietitian, nutrition education specialist, nurse, or other resource persons
- publishing a school newsletter on the value of good nutrition

MULTICULTURAL SENSITIVITY



Without a doubt, Texans live in a culturally diverse society. Multicultural education can help prepare young people to be sensitive to multicultural attitudes, beliefs, and interests that are present at home, school, and in the community. Therefore, it is important that all educators in the state, and particularly those involved in nutrition education, need to be sensitive to the precepts of multicultural education.

Through formal and informal multicultural approaches, nutrition educators can develop and promote the kind of multicultural sensitivity that needs to become an integral part of every teacher's repertoire of skills. The basis for this approach is provided by the State Board of Education rules. Title 19, Part II of the Texas Administrative Code of Statutory Citations, Chapter 97, Subchapter B, Principal V (97-25), Standard 3 states, "The district's curriculum is adapted appropriately to meet the needs of all students, including those in special education and special populations."

In addition to rules that point toward multicultural education and sensitivity, an important humane consideration is obvious. We can better reach students when we teach the whole child and to teach the whole child, we need to understand, accept, and incorporate cultural differences into the classroom setting.

Students of many cultures in large urban school districts and smaller rural schools throughout Texas will respond well to teaching techniques that give consideration to their differences in backgrounds and experiences. This approach is especially appropriate in nutrition education because food availability as well as cultural food traditions vary greatly from student to student.

Inservice and training are useful in increasing teacher awareness and sensitivity, but simply being cognizant of one's classroom and school environment can do a great deal to promote understanding of multicultural issues.

The following are a few specific strategies and suggestions that encourage multicultural sensitivity:*

- Realize that students are influenced greatly by personal relationships and praise or disapproval.
- Teach to oral language strengths in both speaking and listening.
- Utilize many students' desire to work cooperatively.
- Provide whole group and tutorial instruction.

BEST COPY AVAILABLE

- Be a willing learner, a student of their culture.
- Form individual relationships with students. Learn to spell and pronounce their names correctly.
- Realize that once you have been accepted, you will become an active role model.
- Do everything possible to enhance self-concept.
- Expect your students to succeed; believe they are capable of achievement.
- Do not think of multicultural education as remedial or compensatory.
- Do not make learning competitive.
- Evaluate holistically in terms of individual growth.

*These and other strategies are listed in "Toward a Rationale for a Supervisory Model of Instruction in Multi-Cultural Student Populations or Sweathogs Won't Bite" by Catherine A. Baker. (ERIC Document No. 246005)

Instructor's Resource Guide for Teaching Nutrition Education

The main goal of nutrition education is to provide students with the knowledge and skills needed to make wise food choices throughout their lifetimes. In order to accomplish this, nutrition education must include the cognitive, affective, and psychomotor domains of learning. Positive change in dietary habits and in the ability to make wise food choices can be accomplished when students are given opportunities that enable them to:

- Recall and relate basic nutrition information. (Cognitive)
- Choose to adopt this information to their own personal value system. (Affective)
- Develop and practice skills that are needed to accomplish nutrition education goals. (Psychomotor)

BASIC NUTRITION PRINCIPLES

Nutrition is the foundation for good health and results in the effect of food on the body. The statement, "You are what you eat," is certainly true from the standpoint of nutrition and good health. The study of nutrition is a science that involves the relationship of growth, development, and overall health to the intake of nutrients. People need to have basic knowledge of nutrition so they can separate fact from fallacy in health and nutrition claims.

Implications of Food: Physiological, Psychological, Social

The past decade has seen Americans take a sincere interest and dedication to improved individual health and wellness. Consumers are concerned with the latest scientific findings on health issues and nutrition-related topics.

Physiological Implications.
Improved nutritional knowledge and a better understanding of the relationship of nutrition to health and prevention of disease has had a significant impact on the increased human life span in the past 100 years. One hundred years ago, the average human life span was 40 years. Today, the average American has a life expectancy of 75 years.

Food is the way in which the body obtains nourishment. The nutrients that the body gets from food not only enable the body to work, but also supply it with building blocks for growth and development of bones and tissue, supply energy for work and play, and provide other nutrients that enable the body to perform all of its important functions.

Besides the nutritional importance of eating, there are other physiological factors involved. The four senses that influence the appetite and the satisfaction gained from eating are sight, smell, taste and touch. These factors are directly related to the feelings of hunger and satiety that occur before and after eating.

Psychological Implications.

Along with the body's demanding need for nourishment, food has other roles as well. For most people, food has an emotional value that is influenced by intrinsic and extrinsic factors.

In infancy, food fulfills the need for affection, comfort, and security. For all humans, food fulfills the need for security and relieves the tensions and anxieties brought on by hunger. Many people use food in an attempt to satisfy their feelings of anxiety, boredom, or loneliness. All of these factors are intrinsic factors that occur in response to emotions. There are also many extrinsic, or external, factors that psychologically influence food habits. Advertising, movie theaters, spectator sports, and television programming send signals to people to eat. Thus, certain food habits are established as a result of these influences. People are also influenced by the food choices made by family and friends. Food is often used to boost self-esteem in the presence of others, or as a means to feel included with a certain group.

Social Implications.

Foods, as well as eating patterns, have many social implications. Not only do people associate food and mealtime with social gatherings of family and friends, but they also associate certain foods, occasions, locations, and people with eating. Many people have childhood recollections of going to a family member's home, such as grandparent's, for a special meal. Likewise, other people associate food with times of celebration and crisis. In cultures all over the world, people prepare and serve food as part of most social gatherings.

It is important that nutrition educators consider all of these factors when helping children and adolescents acquire good dietary habits that will carry over into their adult lives.

BEST COPY AVAILABLE

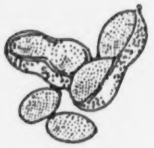
The Nutrients

Nutrients are life-sustaining chemical substances that nourish and promote the growth of the human body. No one food contains all of the nutrients necessary for the body to function effectively; therefore, a balanced diet that incorporates appropriate amounts of the six essential nutrients, as well as recommended servings from the food groups, is necessary. Individuals should choose foods of high nutrient density rather than foods with empty calories. Foods that are nutrient dense are foods that are excellent sources of essential nutrients with few, if any, empty calories. ***Empty calorie foods*** refer to foods that provide calories or energy but little or no nutritive value. The six essential nutrients are:

- protein
- carbohydrates
- vitamins
- minerals
- fats
- water

The ***RDA*** is the Recommended Dietary Allowances for Americans. The RDA serves as a guideline for determining the amounts of nutrients a specific person needs each day. It gives the specific recommended daily nutrient needs for a person according to age and gender. The RDA is established by the National Food and Nutrition Board of the National Academy of Sciences. The ***U.S. RDA*** are the Recommended Daily Allowances developed by the Food and Drug Administration for use on food labels. The U.S. RDA is a standard that everyone can use to approximate daily nutrient needs.

Protein.



Protein is the main component of every cell in the human body. Without protein, the human body would not be able to survive. Protein performs three very important functions. The body uses protein for:

- Growth and repair of new and damaged tissues.
- Regulating all body functions, and transporting other nutrients and oxygen throughout the body.
- Supplying energy when adequate amounts are not supplied by carbohydrates and fats.

Protein is comprised of compounds called amino acids. Amino acids are often referred to as the building blocks of protein. There are 22 different amino acids. Thirteen of these amino acids are manufactured in the body, and the remaining nine amino acids must be supplied by the diet. These nine amino acids are often referred to as essential amino acids because it is essential that they be furnished by the diet. The body cannot function without these nine essential amino acids. People in less developed countries suffer from many diet-related diseases and other health problems because of the shortage of protein foods.

Baked Beans

Protein foods that supply all nine of the essential amino acids are called ***complete proteins***. Foods that supply only some of the nine essential amino acids are called ***incomplete proteins***. Two incomplete protein foods can be eaten together to form a complete protein source. Most generally, animal proteins are complete protein sources and plant proteins are incomplete protein sources. However, animal proteins also provide more fat and calories than plant proteins. It is a wise dietary practice to consume combinations of plant proteins to fulfill some of the body's need for complete proteins. Some examples of combining incomplete proteins to form complete proteins are:

- Legumes (dried beans, lentils, split peas) and rice
- Pinto beans and corn tortillas
- Peanut butter sandwich (Peanuts are a legume.)

Another way to form complete proteins is to combine a small amount of animal protein with an incomplete protein source. Some examples include:

- Bean soup with small amounts of chopped ham
- Macaroni and cheese
- Cereal and low-fat or skim milk
- Baked potato with cottage cheese
- Spaghetti with tomato sauce and a small amount of meat

The average American adult eats twice as much protein as is needed. It is recommended that 10-15% of calories come from protein for most children and adults. Protein needs increase during times of growth, such as childhood, adolescence, pregnancy, and lactation. People should consult the Recommended Dietary Allowances (RDA) for gender and age group guidelines for protein requirements.

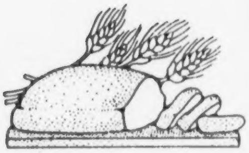
Carbohydrates.

Carbohydrates are nutrients that supply energy for body functions. The other energy sources are proteins and fats. Fifty to fifty-five percent of calories should come from complex carbohydrates. Carbohydrates are broken down in the body into sugars, starches, and fiber. The sugars are known as simple carbohydrates, and the starches and fibers are known as complex carbohydrates. Carbohydrates perform three important functions in the body. The body uses carbohydrates to:

- supply energy
- supply fiber
- aid in the digestion of fats

- ***Monosaccharides*** are the simplest form of carbohydrates. The monosaccharides are glucose, galactose, and fructose. Sugars and starches are broken down in the body into the simple sugar glucose. ***Glucose*** is the major sugar found in the bloodstream and supplies energy for the body. Some body tissues, such as red blood cells and parts of the brain, are able to get energy only from glucose. ***Fructose*** is found in honey and fruits and is known as the sweetest of the sugars. ***Galactose*** is not found in nature, but is one of the two monosaccharides available after the breakdown of lactose (milk sugar).

- ***Disaccharides*** are formed when two glucose molecules are joined together. They are broken down into monosaccharides during digestion. The disaccharides are sucrose, maltose, and lactose. ***Sucrose*** is found in white refined table sugar, brown sugar, confectioner's sugar, cane sugar, beet sugar, molasses, and maple syrup. ***Maltose*** is malt sugar which is found in sprouting cereal grains. ***Lactose*** is milk sugar and is found only in milk.

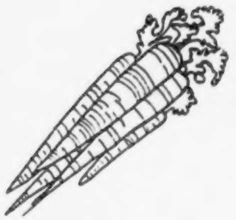


- ***Polysaccharides*** are the complex carbohydrates. They include starch, cellulose, and glycogen. ***Starch*** is the most abundant polysaccharide. Starch can be found in roots, legumes, grains, and vegetables, but must be broken down into glucose by the body before it can be utilized. ***Cellulose*** is the fibrous material found in plants and is commonly referred to as fiber or roughage. Cellulose cannot be digested by humans. Sources of cellulose include vegetables, fruits, and whole grain cereals. Glycogen, also known as animal starch, is the storage form of carbohydrates found in the liver and muscles. Glycogen in the liver is easily broken down into blood glucose, and muscle glycogen supplies glucose for muscle use. This is especially important during periods of intense exercise.

Vitamins.

Vitamins are organic compounds necessary for normal growth, maintenance of health, and reproduction. Vitamins help the body convert carbohydrates and fat into energy and assist in the formation of bones and tissues. Vitamins are essential for maintaining good health as the body cannot survive without them.

Vitamins are either fat soluble or water soluble. ***Fat-soluble vitamins*** cannot be dissolved in water, so they are stored in body fat until they are transported to the cells by the blood. ***Water-soluble vitamins*** are easily dissolved by water and therefore are not stored in the body. Water-soluble vitamins must be replenished daily.



Vitamins A, D, E, and K are the fat-soluble vitamins. The functions and sources of each of the fat-soluble vitamins include the following :

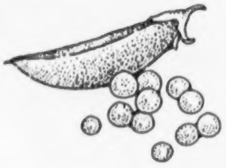
- ***Vitamin A*** (retinol) is responsible for night and color vision, growth of bones and teeth, and production of healthy skin. Sources of vitamin A include dark green and dark yellow vegetables, fruits, egg yolks, whole milk, liver, butter, and fish oils.

- ***Vitamin D*** (calciferol) is important for the normal growth and development of bones and teeth , and it aids in the absorption and utilization of calcium and phosphorus. Sources include egg yolks, liver, fish liver oils, and fortified milk. The primary source of vitamin D is the sun. However, excessive exposure to the sun puts a person at risk for certain types of skin cancer.

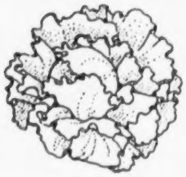
- ***Vitamin E*** (alpha tocopherol) protects cells from oxidation. ***Oxidation*** is a chemical change that occurs as a result of exposure to oxygen. When blood cells or tissue cells are exposed to oxygen, the resulting chemical change known as oxidation causes a weakening of the cells walls and thus damages the tissues. Vitamin E is most effective in protecting the red blood cells in the lungs and the cells in the lung tissue because of their continuous exposure to oxygen. Oxidation also occurs when foods are exposed to oxygen and results in a loss of vitamins, as well as food spoilage. Sources of vitamin E include vegetable oils, wheat germ, whole-grain bread and cereal products, liver, fish liver oils, and green leafy vegetables.

- ***Vitamin K*** (phylloquinone and menaquinone) is necessary for blood clotting. Sources include green leafy vegetables, broccoli, peas, liver, cheese, and eggs.

The water-soluble vitamins include the eight B vitamins and vitamin C. The functions of each of the water-soluble vitamins and sources of each include:



- ***Thiamin*** (vitamin B_1) helps break down carbohydrates in the body and helps the body release energy from food. It is necessary for cell respiration, promotion of normal appetite and digestion, and maintenance of a healthy nervous system. Sources include enriched whole-grain products, liver, peas, and pork. Thiamin is heat sensitive and is easily leached into the cooking liquid. Proper food storage and preparation practices are essential to maintain the thiamin level in foods.



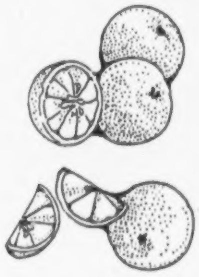
- ***Riboflavin*** (vitamin B_2) is necessary for the body to break down carbohydrates and keep the skin, tongue, and lips in normal condition. Sources include cheese, eggs, enriched breads, leafy green vegetables, lean meats, and legumes. Riboflavin is easily destroyed by exposure to light, especially sunlight. It is important to store these foods either in a pantry or in the refrigerator to prevent nutrient loss.
- ***Niacin*** (vitamin B_3) is vital to the nervous system. It helps cells convert food to energy and is beneficial for the mouth, skin, and tongue. It helps the digestive tract to function properly. Sources include liver, lean meats, whole grains, nuts, and legumes. Currently, there is research into the effects of niacin in lowering blood cholesterol. However, due to the toxic side effects of high doses of niacin, self-prescribed niacin supplements are not recommended.
- ***Folate*** (also called folacin or folic acid) is necessary for the body to produce normal red blood cells and for the biochemical reactions of cells in the production of energy. Sources include wheat germ, wheat bran, yeast, leafy green vegetables, liver, and legumes.
- ***Biotin*** is essential in the breakdown of carbohydrates, lipids, and proteins in the body. Sources include liver, kidneys, egg yolk, vegetables, and fruits (especially bananas, grapefruit, watermelon, and strawberries.)

- ***Pantothenic Acid*** aids in the metabolism of fat and the formation of cholesterol and hormones. Sources include all plant and animal tissues with the best sources being liverwurst, meats, poultry, egg yolk, wheat germ and rice germ, tomato paste, sweet potatoes, oatmeal, and milk.
- ***Pyridoxine*** (vitamin B_6) is needed to help nervous tissues function normally, to maintain the health of the skin and red blood cells, and to participate in the metabolism of proteins, carbohydrates,

and fats. Sources include liver, lean meats, cereals, vegetables, and milk.

- ***Cyanocobalamin*** (vitamin ${}_{B12)}$ is necessary in the development of normal growth, normal functioning of all body cells, metabolism of folate, and protection against pernicious anemia. Pernicious anemia primarily results from the body's inability to absorb vitamin B_{12}. However, it can result from a deficiency of vitamin B_{12} in the diet. Vitamin B_{12} is found only in animal protein. Liver, clams, oysters, muscle meats, eggs, chicken, and milk are the best sources.

- ***Ascorbic Acid*** (vitamin C) aids in the formation of hemoglobin, helps fight infection, aids in healing of wounds, aids in the formation and maintenance of collagen, and aids in the absorption of iron and calcium. Sources include citrus fruits, cantaloupe, strawberries, dark leafy green vegetables, broccoli, cabbage, and green peppers.



Research continues into the role vitamins and minerals play in preventing chronic disease and in maintaining health and wellness. The ***Recommended Dietary Allowances (RDA)***, developed by the National Academy of Sciences, serves as a guideline for determining the amounts of nutrients a specific person needs each day. The RDA is found in Appendix D of the *ESR IV* curriculum guide.

Minerals.

Minerals are necessary for building bones, tissues, and other compounds, as well as for regulating body processes. Minerals found in large amounts in the body are called ***macrominerals***. Macrominerals include calcium, phosphorus, magnesium, sodium, potassium, and chloride. Minerals found in small amounts in the body are called trace elements or ***microminerals***. Trace elements are iron, iodine, zinc, and fluorine. Figure 1 lists macrominerals, their primary functions, and sources. Figure 2 lists primary functions and sources of microminerals.

MACROMINERALS

Macrominerals	*Functions*	*Sources*
Calcium	• Needed for bone rigidity, blood clotting, muscle contraction, normal nerve functions • Just because an individual eats food containing calcium does not mean that the body absorbs the calcium. Factors that increase calcium absorption include: - an overall balanced diet - intake of vitamins D and C - intake of certain amino acids • Factors that decrease calcium absorption include: - a vitamin D deficiency - fat malabsorption - eating large amounts of fiber - lack of exercise - stress - lactose deficiency or lactose intolerance	Milk and milk products, soft-boned fish, calcium-fortified orange juice, leafy green vegetables, and broccoli.
Phosphorus	• Helps build strong bones and teeth, and is a significant factor in all phases of calcium metabolism	Meat, poultry, liver, fish, eggs, milk, other dairy products, raw oranges, cherries, peaches, rice, potatoes, and wheat flour. Eating foods high in calcium will provide adequate phosphorus.
Magnesium	• Helps regulate - body temperature - muscle contractions - the nervous system • Helps cells utilize - carbohydrates - fats - proteins	Green leafy vegetables; nuts, including Brazil, almonds, and cashews; muscle meats; salmon; cheddar cheese; beef liver; milk; and eggs. Vitamin D increases the body's absorption of magnesium.
Sodium, chloride, potassium	• These three work together to: - regulate the flow of fluids in the body - help regulate the nervous system - help regulate the muscle functions,including heart - help regulate nutrient absorption in the cells	Sources for sodium and chloride are found in table salt, while potassium can be found in meats, milk, bananas, leafy green vegetables, and citrus fruits.

Figure 1

MICROMINERALS

Microminerals	*Functions*	*Sources*
Iron	• Found primarily in the blood, where it combines with protein to form hemoglobin (oxygen-carrying protein in the blood.)	Liver and other organ meats, egg yolks, dried legumes, shellfish, leafy green vegetables, and enriched breads. It is estimated that only 10 to 15 percent of the iron in foods is actually absorbed.
Zinc	• Zinc is needed for the lungs to release oxygen.	Oysters, herring, egg yolks, and organ meats.
Copper	• Copper is necessary in the formation of hemoglobin.	Liver, bran flakes, and cocoa powder.
Manganese	• The role of manganese is not well-understood.	Nuts, rice, whole grains, beans, and leafy green vegetables.
Selenium	• Selenium works in conjunction with vitamin E to protect cells from destruction. It has been suggested that selenium may have a role in the prevention of cancer.	Fish, organ meats, shellfish, and eggs. Grains and other plants, grown in selenium-rich soil are also good sources.
Chromium	• Chromium maintains the normal glucose uptake into cells and helps insulin bind to cells.	Vegetable oils, egg yolks, whole grains, and meats. Fruits, vegetables, highly processed foods, and drinking water are generally poor sources of chromium.
Iodine	• Iodine is needed for the thyroid gland to produce thyroxine, which is essential for the oxidation rates of cells.	Iodized salt, ocean fish, seaweed, and milk.
Fluoride	• Fluoride is needed to prevent tooth decay.	Fluoridated drinking water, seafood, tea, fluoridated toothpaste, and fruits and vegetables grown in areas where natural fluoride level in the water is high.

Figure 2

Fats.

Fats are semisolid, energy-filled organic compounds found in animal and plant tissues. The term ***lipids*** is often used interchangeably with the term fat to describe fats, oils, and fat-related substances. Lipids in the simplest forms are called fatty acids. The major form of fat in the body and in foods is known as triglycerides. ***Triglycerides*** are chemical compounds that contain carbon, hydrogen, and oxygen. Fats or lipids are important sources of energy needed by the body. Calories from fat should not exceed 30% of the total daily calorie intake. Functions of fat in the body include:

- provide energy
- transport and absorb fat-soluble vitamins
- cushion vital organs in the body
- comprise part of the structure of body cells
- supply essential fatty acids
- add flavor to foods
- satisfy appetites by delaying hunger
- insulate the body
- serve as protection for nerves and blood vessels

Fats are classified as saturated, monounsaturated, or polyunsaturated. The more saturated the fat, the more solid it is at room temperature.

- ***Saturated fats*** have the most hydrogen. Saturated fats are found in butter, chocolate, egg yolks, lard, shortening, and many other foods. Saturated fats should not exceed 10% of the total calories from fat.
- ***Monounsaturated fats*** have less hydrogen than saturated fats. Some examples of monounsaturated fats include some cooking oils, olive oil, some peanut butter, and some salad dressings.
- ***Polyunsaturated fats*** have the least amount of hydrogen. Polyunsaturated fats are found in such foods as Brazil nuts, some cooking oils, some peanut butter, soft margarine, and walnuts.

Water.

Water is necessary in the body for many reasons. It acts as a solvent for nutrients and hormones. Water also transports nutrients to the cells and rids the body of waste products. It lubricates the joints, facilitates food passage, and regulates body temperature through conduction of heat, perspiration, and excretion. The body typically uses two to two and one-half liters of water per day. It is recommended that the daily diet include at least eight 8-ounce glasses of water per day. Sources of water include beverages, soups, water, and milk. Other sources are:

• vegetables	87 percent
• fresh fruits	86 percent
• eggs	74 percent
• beef	60 percent
• bread	36 percent

Functions of Dietary Fiber

Fiber has been one of the new *health words* since the early 60s. However, very few people really understand the role fiber plays in nutrition and health. Fiber comes from the contents of plants that the human body cannot digest.

There are many types of fiber. Fiber is classified into two categories: soluble and insoluble. Soluble fiber is dissolved in water and may help control diabetes and lower blood cholesterol levels in some people. Soluble fiber is found in some fruits, beans, and oat bran. Insoluble fiber is not able to be dissolved in water and therefore has different functions from soluble fiber. Insoluble fiber helps move food through the digestive tract. It aids in the prevention of colon and rectal cancer, helps to control diverticulosis, and helps prevent constipation. Diverticulosis is caused when bulging pockets form on the intestinal wall and can become inflamed. Sources of insoluble fiber are fruits, vegetables, wheat bran, whole wheat, and some beans.

Fiber has many functions in the body. Some of these functions that help prevent medical problems include:

- Keeps contents of the intestines moving and prevents constipation.
- Helps reduce the risk of colon cancer by allowing food to pass quickly through the digestive tract. This limits susceptibility to agents in food that might cause cancer.
- Stimulates muscles of the digestive track. Well-toned digestive track muscles aid in prevention of diverticulosis and hemorrhoids.
- Absorbs water and gives a feeling of fullness. This helps people feel full longer, contributing to healthy eating and weight control.

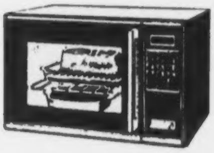
The United States Departments of Agriculture and Health and Human Services have adopted a set of seven guidelines that can help Americans choose a healthy diet. These guidelines address some of the problems with the diets of many Americans. The guidelines are found in Appendix F.

Retaining Nutrients in Food

While learning which nutritious foods to choose at the supermarket, it is important to learn how to store and prepare those foods so that most of the nutrients are retained. Several factors should be considered when storing and preparing foods to promote nutrient retention and to prevent nutrient loss.

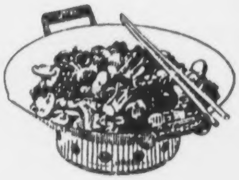
Many people assume they are getting all the nutritional value of a food just by eating it. What they do not stop to consider is that quality, storage, and preparation techniques all influence the amount of nutrients that are retained in food.

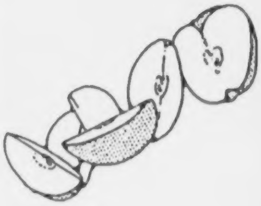
Many foods in our culture are considered highly palatable when eaten in their raw form. ***Palatable*** refers to the acceptability of the food to the palate, or taste. Foods that appeal to a person's sense of taste, smell, and sight, as well as foods with the appropriate temperature and texture, are considered palatable. Fruits and vegetables are the foods most commonly eaten in raw form. This is especially important when considering the nutrients that are not lost through cooking. In many cases, however, cooking improves the palatability, flavor, color, texture, and digestibility of food. Cooking also destroys organisms and bacteria that could cause food-borne illnesses.



Consumers can take precautions to preserve the nutrients in the foods they prepare by following some food preparation practices. Microwave cooking, steaming, and stir-frying are methods that improve nutrient retention in foods. Simmering foods in a small amount of liquid for a minimal amount of time also helps to improve nutrient retention. Some additional suggestions for preserving the nutrient content of foods prepared at home include:

- Avoid overcooking. Prolonged exposure to heat causes loss of some vitamins.
- Cover refrigerated foods with tight-fitting lids, foil, or plastic wrap.
- Cut fruits and vegetables in large pieces. Chop immediately before use to avoid unnecessary exposure to oxygen.
- Freeze or refrigerate leftovers immediately after use. Leaving foods exposed to room temperature increases nutrient loss, promotes an environment for bacteria to grow, and increases rate of spoilage.
- Include raw fruits and vegetables in menu planning and food preparation.
- Refrigerate most products to reduce nutrient loss.
- Rinse foods in cold water. Do not soak. This causes loss of valuable water-soluble nutrients.
- Thaw frozen foods in the refrigerator. More nutrients are retained at cooler temperatures, and this also inhibits the growth of organisms that can cause food-borne illness.





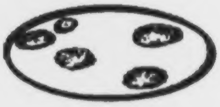
Food Safety

Food safety is a topic of interest and concern for professionals in the food industry as well as for consumers. Consumers need to be informed about food safety practices in the home. The Food and Drug Administration continually monitors the food supply to ensure its safety.

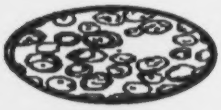
At least one million people in the United States suffer from food-borne illnesses each year. The hazards of food-borne illness can be avoided by sanitary food handling and effective food preparation techniques. To reduce the effects of contamination, the growth of microorganisms must be slowed by refrigeration or destroyed by heat. ***Microorganisms*** are tiny living cells that can be seen only with a microscope. Microorganisms are everywhere–in the body, in the soil, in the water, and in the air.

Microbiological hazards account for the most cases of food-borne illness. The four types of microorganisms that affect food are bacteria, viruses, yeasts, and molds. Food-borne illnesses caused by microbiological hazards are classified as either infections or intoxications. A ***food-borne infection*** is a disease caused by eating food containing harmful microorganisms. A ***food-borne intoxication*** is an illness caused by poisons or toxins in the food a person eats. The toxin may occur naturally in the food, as in certain mushrooms, or the food may be contaminated by toxins produced by certain microorganisms.

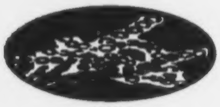
Bacteria



Viruses



Yeasts



Molds

Bacteria are small, single-cell organisms that can live anywhere people can. They thrive in a warm, moist environment that is neutral or slightly acidic. Bacteria are more commonly involved in cases of food-borne illness than are viruses, yeasts, and molds. Common names of some food-borne illnesses of bacterial origin are staph, botulism, perfringens poisoning, salmonellosis, and listeriosis. The bacteria that cause the illnesses are *Staphylococcus aureus, Clostridium botulinum, Clostridium perfringens, Salmonella, and Listeria monocytogenes.*

Viruses are the smallest and perhaps the simplest form of life known. They cause illnesses such as colds, influenza, and infectious hepatitis. Viruses do not increase in number while they are in the food. The food merely transports the viruses, which may then lodge themselves in the human host and produce abundantly.

Yeasts are fungi that require sugar, proper temperature, and moisture for growth. Yeasts often consume these ingredients in food products and spoil the food in the process. Yeast organisms can be killed by heating to 136°F (56°C) for about fifteen minutes. Yeast spoilage can create a slime on fruit juices or pickle brine (the solution in which pickles are preserved) or a pink discoloration in cottage cheese. However, no evidence suggests that yeast-producing diseases in humans are transmitted by food or that yeasts occurring naturally in foods are harmful to humans.

Molds are furry-looking fungi that can grow on almost any food at almost any storage temperature, under almost any conditions–moist or dry, acidic or nonacidic, salty, or sweet. The color of mold is usually white but also can be blue-green, orange, black, gray, or even red. Soft food items such as yogurt, sour cream, cheese slices, jams and jellies, tomatoes, and cucumbers with mold spots should be discarded. Figure 3 lists food safety guidelines that help people avoid food-borne illness.

FOOD SAFETY GUIDELINES—
AVOIDING FOOD-BORNE ILLNESSES

- Refrigerate or freeze leftovers immediately after use.
- Thaw frozen foods in the refrigerator, never on the counter. The warm temperature is a perfect environment for microorganisms to thrive.
- Keep hot foods hot, and cold foods cold. Lukewarm temperatures allow bacteria to grow.
- Use a meat thermometer when cooking meat and poultry. Insert the thermometer in the thickest part of the meat away from the bone. For poultry, the internal temperature should reach 180° to 185°F.
- Use a different cutting board and different utensils for preparing fruits and vegetables than is used to prepare raw meat and poultry.
- Carefully wash all utensils used to prepare raw meat and poultry in hot, soapy water.
- Wood cutting boards can be thoroughly cleaned in a bleach and water solution. The bleach will kill any bacteria left on the cutting board.

Figure 3

SELECTING A BALANCED DIET

Nutrition education is valuable only if children and adults make healthy food choices a part of their daily lives. This new nutrition knowledge is only worthwhile if it is put into practice everyday. The USDA's "Pattern for Daily Food Choices" illustrates the food guide presented in the "Dietary Guidelines for Americans" found in Appendix F. The "Pattern for Daily Food Choices" helps consumers use the guidelines by suggesting the number of servings to choose from each food group daily. It is found in Appendix C.

Self-Responsibility for Health and Wellness

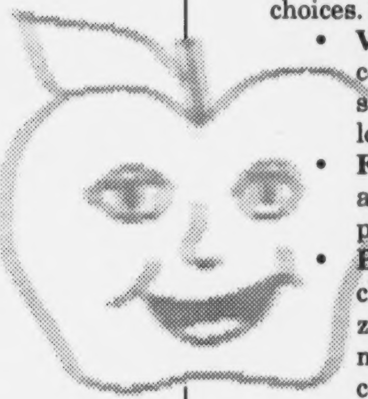
Most people, regardless of age, ultimately have control over what they actually eat. Therefore, each person assumes the responsibility for the food choices he or she makes. Thus, the *ESR IV* objective, "Make wise food choices as part of self-responsibility for health and wellness," is applicable to school children of all ages. A primary goal of nutrition education is to prepare school age children for a lifetime of healthy dietary habits.

Nutritious Snacks

Snacking has become part of the fast-paced American lifestyle. Nutritious snacks can contribute valuable nutrients and can help meet the daily nutrient requirements for persons of all ages. Snacks are especially beneficial for small children and older adults who have difficulty consuming adequate amounts of food at mealtime. Adolescence is a time of rapid growth, and many teenagers need snacks to provide additional nutrients and calories. Many people feel better when they consume five or six small meals rather than the customary three meals a day.

Snack foods not only contribute to daily nutrient needs, but also contribute to the total number of calories consumed.

There is an abundance of nutritious snack foods available to consumers. Offering people snack foods from the five food groups (Vegetables, Fruits, Breads and Cereals, Milk, and Meat) allows them to make nutritious choices. Some suggestions for nutritious snacks include:



- **Vegetables** such as broccoli and cauliflower florets, carrot sticks, celery sticks, cucumber slices, cherry tomatoes, and green pepper slices can be eaten alone or with dips made from low-fat yogurt or low-fat cottage cheese.
- **Fruits** that are easy to "take along" and make good snacks include apples, bananas, grapes, nectarines, oranges, peaches, pears, plums, raisins, and tangerines.
- **Breads and cereal products** are easy to serve for snacks. Include bagels, crackers, finger sandwiches, muffins, popcorn, pretzels, and tortillas in the list of snack choices. Children enjoy making shaped sandwiches by cutting bread into shapes with cookie cutters.
- **Milk beverages and milk products** such as cheese and yogurt are nutritious snack choices. Also included in this group are cottage cheese, frozen dairy products made with low-fat milk, and puddings. Adding fresh fruits to plain, low-fat yogurt makes a great snack and is lower in fat and calories than commercial fruit yogurts.
- **Meat group foods** can be snack foods, too. Tuna fish and peanut butter can be served with crackers or used as the filling for finger sandwiches. Nuts and seeds provide protein in the form of a crunchy, ready-to-eat snack.

It is important to be aware of the many snack foods that are high in calories, fat, salt, and sugar. Many of these foods contain coconut oil or palm kernel oil which are high in saturated fat. It is necessary to read the nutrition information on the labels carefully to be sure the oil used is one of the unsaturated oils, such as canola, corn, safflower, or soybean.

Food Choices and Peer Pressure

Typically, most Americans associate food and eating with social experiences. Even the family evening meal is a social gathering. Food choices and food preferences are influenced by family traditions, personal likes and dislikes, as well as those likes and dislikes of friends and family members. In teaching children and adolescents to make wise food choices, it is important to recognize that peer pressure is a major factor. Students who learn decision-making skills and have a good self-concept are more likely to be able to make food choices based on nutritional knowledge rather than on peer pressure.

NUTRITIONAL NEEDS DURING THE LIFE CYCLE

Nutritional needs change during the various stages of the life cycle. The varying stages of growth that take place from infancy through adolescence make different demands on the body's nutritional health. Likewise, the three stages of adulthood have different nutritional requirements.

Due to increased health awareness and advances in medical science, Americans are living longer than ever before. It is anticipated that by the year 2050, the percentage of the population age eighty-five years and older will increase to more than 5 percent of the total U.S. population. These predictions increase the need for consumers to understand the nutritional needs during the various stages of the life cycle. Figure 4 lists the stages and nutritional requirements of various stages of the life cycle.

Special Dietary Needs

In the last decade, the American population has taken a serious look at health and health issues. The relationship between lifestyles, daily diets, and health and fitness has become a topic of conversation and confusion for many people. Media attention to all types of special diets has caused alarm for many people. It is necessary to understand the health problems that require people to greatly modify their diets. Information related to low-cholesterol, low-fat, low-salt, and low-sugar diets is important for all consumers to know and understand.

Special Nutrition Requirements
During the Stages of the Life Cycle

Life Cycle Stage	Nutrition Requirements
Pregnancy (includes nursing mothers)	Approximately 300 additional calories are required each day for increased energy needs. Weight gain should average between 24 to 28 pounds during pregnancy. A well-balanced, nutritious diet is important because of the increased need for protein, vitamins, and minerals. The diet should include more milk products and more fruits and vegetables.
Infancy (Birth through 1 year)	Most of the infant's nutritional needs during the first year are met through human milk or infant formula. Formulas contain amounts of protein, vitamins, and minerals recommended by the American Academy of Pediatrics. Some formulas are iron-fortified. It is not recommended that solid foods be given to infants until four to six months of age.
Early Childhood (2 years through 5 years)	Childhood obesity and iron-deficiency anemia are the two nutritional problems most commonly diagnosed during childhood. Children should be fed nutritious foods at every meal. Breakfast is especially important, and nutritious snacks help meet the child's daily nutrient needs. Iron-fortified breakfast cereals and lean meat help supply daily iron requirements.
Middle Childhood (6 years through 12 years)	Children should be encouraged to eat a variety of nutritious foods at mealtime and snack time in order to meet their daily nutritional needs for growth and development. Children of this age can learn to choose healthy foods. Snack foods may need to be monitored at this time because
Adolescence (13 years through 20 years)	Rapid growth periods occur in girls between the ages of 10 and 13 years, and in boys between the ages of 12 and 15 years. Consumption of well-balanced, nutritional meals is important during these years. An increased need for calcium occurs due to rapid bone growth. Teens need to increase their intake of foods from the milk group. Poor food choices during adolescence lead to inadequate intake of calcium, vitamin A, and fiber, iron-deficiency anemia, and excessive intake of saturated fats, sugar, and empty calorie foods.
Young Adulthood	It is important for young adults to realize that the food choices, health practices, and lifestyle decisions made in the young adult years have significant effect on health and wellness in later life. Eating a well-balanced diet and exercising on a regular basis are good beginnings for young adults. Iron and calcium intakes are very important. Refrain from smoking and consuming alcohol and try to manage stress.
Middle Adulthood (41 years through 65 years)	Adults in this stage need to follow the guidelines for good health and disease prevention. These guidelines recommend that people should eat a variety of foods, maintain desirable weight, avoid too much fat, saturated fat, and cholesterol, increase intake of foods with sufficient starch and fiber, avoid eating too much sugar and sodium, exercise regularly, refrain from smoking and moderate alcohol intake, and try to manage stress.
Older Adulthood (over 65 years)	A healthy diet can help reduce some of the effects of aging. Poor nutritional health at this stage can affect the severity of disease, as well as affect mental function. Some guidelines for nutritional health for older adults include four to six small meals eaten frequently, sufficient intake of vitamins B_6, B_{12}, thiamin, C, D, E, and the minerals calcium, iron, and zinc is important. Regular exercise is needed to stimulate appetite and food intake. Weight loss can increase the risk of death following illness or disease.

Figure 4

BEST COPY AVAILABLE

Advances in medical science have shown an increasing relationship between the food consumed and good health and that diet is related to disease and recovery. Recently, diet and health information has centered on preventive measures that might reduce a person's risk of heart disease, diabetes, or cancer.

Lowering Blood Cholesterol Levels.

In recent years, cholesterol has received much media attention and has become a household word. Cholesterol is an odorless, soft, waxy substance found in every cell in the body. Cholesterol performs several functions in the body. These include:

- to aid in digestion
- to contribute to the structure and function of cell membranes
- to assist in the manufacture of vitamin D (calciferol) and hormones

It is not necessary to eat foods containing cholesterol because the liver makes most of the cholesterol that the body needs. Even though cholesterol is found in every cell in the body and is necessary for its function, it also makes up the main part of the plaques that block the arteries in atherosclerosis.

Cholesterol travels through the bloodstream in lipoproteins. Lipoproteins are lipids combined with proteins that transport lipids in the blood. There are two types of lipoproteins that transport cholesterol throughout the body. The two types are:

- low-density lipoprotein (LDL)
- high-density lipoprotein (HDL)

Low-density lipoproteins (LDL) carry cholesterol from the liver throughout the body but do not return the cholesterol to the liver. Therefore, cholesterol remains in the arteries and can cause a buildup in the artery walls. High-density lipoproteins (HDL) clear excess cholesterol from the arteries and carry it back to the liver where it is processed and removed from the body. LDL is often called "bad" because of its inability to remove cholesterol from the bloodstream. HDL is often called "good" because of its ability to prevent cholesterol and fat deposit buildup in the artery walls. It is this buildup of cholesterol plaques that contributes to advanced atherosclerosis.

DIETARY GOALS FOR LOWERING BLOOD CHOLESTEROL LEVELS

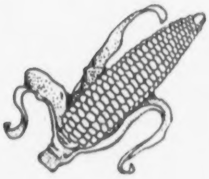
1. Reduce total fat intake to 30 percent of total calories.
2. Include more whole grains in the daily diet.
3. Eat fish more often.
4. Increase consumption of fiber-rich fruits and vegetables.
5. Add the many varieties of legumes to the daily diet more often, such as dried beans and peas and soybeans.
6. Include nonfat or low-fat milk and milk products every day.
7. Reduce the cholesterol-rich foods in the diet, especially organ meats, egg yolks, shellfish, and fatty red meats.

Figure 5

Cholesterol is found only in foods of animal origin. Foods high in cholesterol are egg yolks, liver organ meats, shellfish, lard from animals, and butter. Foods that contain no cholesterol or are low in cholesterol include egg whites, fruits, vegetables, and grains and grain products. One of the major factors in blood cholesterol levels is the dietary intake of fats—particularly saturated fats. Fats are discussed in detail in the earlier section on "Fats." There are certain dietary goals that prove beneficial in lowering blood cholesterol levels. These dietary goals for lowering blood cholesterol are described in Figure 5.

Achieving Low-Fat Diets.

Many Americans are selecting low-fat diets and exercising in an attempt to reduce their risk of coronary heart disease and cancer. ***Fats*** are lipids that are in a solid state at room temperature. ***Oils*** are lipids that are in a liquid state at room temperature. ***Lipid*** is the scientific term that includes all of the fats, fat-related substances, and oils. Fat is one of the essential nutrients and performs several functions in the body. Fats, or lipids, help maintain healthy cell walls, store energy, and transport the fat-soluble vitamins A, D, E, and K throughout the body. Without the presence of fat, these vitamins would not be utilized.



Linoleic acid is an essential fatty acid. It is found in polyunsaturated fat substances, and is important for clotting blood and lowering blood pressure. Linoleic is the only fatty acid the body does not make. It must be eaten in plant foods such as corn, safflower, or soybean oils. Figure 6 gives the formula for figuring the percent of fat calories in the diet.

Figuring the Percent of Fat in the Diet

Number of grams of fat
X 9 calories per gram
Total number of calories from fat

Total number of calories from fat ÷ Total number of calories daily = Percent of calories from fat

Example: An adolescent who eats 2,000 calories per day could figure the percent of his or her diet that was from, fat if 80 grams of fat were consumed.

80 grams of fat
X 9 calories per gram
720 calories from fat

720 calories from fat ÷ 2000 calories per day = 36 % from fat

Figure 6

To Achieve a Low-fat Diet

- Read labels to learn the fat content of foods.
- Choose to bake, broil, braise, or steam foods; eliminate frying.
- Refrigerate soups and stews before serving. Skim off hardened fat.
- Reduce intake of high-fat desserts.
- Reduce consumption of bacon, sausage, and luncheon meats.
- Use herbs, spices, and lemon juice to season and flavor foods.
- Choose canned fish products packed in water.
- Try using low-fat, low-calorie salad dressings.
- Use non-stick sprays in frying pans before sauteing.
- Choose low-fat or fat-free menu items and snack foods.
- Skin poultry and trim visible fat from lean meats.
- Use vegetable protein sources such as lentils, dried beans, and peas.
- Use low-fat and nonfat dairy products.
- Reduce consumption of foods high in saturated fat.
- Reduce total dietary fat intake.

Figure 7

At nine calories per gram, fats supply twice as much energy as carbohydrates and proteins. Carbohydrates and proteins provide four calories of energy per gram. It is not necessary to consume a fat-rich diet because the body makes fat from excess carbohydrates and proteins not used for energy. Diets containing large amounts of fat can lead to health risks.

Health professionals believe that the average American diet contains too much fat. Although there is no RDA for fat, it is recommended that fat intake be limited to 30 percent of the total calories.

Some commonly eaten foods may have a higher fat content than many consumers realize. For example, amounts of fat in common foods include:

- Hamburger with mayonnaise—approximately 35 grams of fat, 315 calories from fat
- Club sandwich—approximately 30 grams of fat, 270 calories from fat
- Fried onion rings—approximately 23 grams of fat, 207 calories from fat
- Beef burrito—approximately 21 grams of fat, 189 calories from fat
- Baked potato with sour cream and chives—approximately 24 grams of fat, 216 calories from fat
- Baked potato, plain—approximately 2 grams of fat, 18 calories from fat

(These are approximate amounts. The exact fat content would vary, depending on the serving size and method of preparation.)

Foods High in Saturated Fat

- Bacon, some luncheon meats
- Beef, lamb, pork, chicken with skin
- Butter and lard
- Cakes, pastries
- High-fat cheeses
- Sour cream and ice cream
- Tropical oils (coconut, palm, and palm kernel)

Foods High in Unsaturated Fat

- Nuts—peanuts, pecans, cashews, walnuts
- Soft margarines and spreads
- Vegetable oils—canola, corn, cottonseed, safflower, soybean, sunflower

Figure 8

High-fat diets lead to elevated blood cholesterol levels. People with abnormally high blood cholesterol levels are in a high-risk group for advanced atherosclerosis. In order to maintain a normal blood cholesterol level, people should reduce their intake of saturated fats. Figure 8 lists examples of foods high in saturated and unsaturated fats.

Sodium and Hypertension.

Sodium and potassium are minerals that function in the body as electrolytes. Electrolytes affect the way fluid is distributed in the body and aid the nervous system in transmitting nerve impulses that control muscle action. This is very important in keeping the heart beating normally. Sodium also helps the kidneys to maintain a normal acid/alkali balance in a person's body. Potassium loss along with sodium loss causes vomiting, diarrhea, and increased sweating. Replace fluids with juices and fruit. There is no need to take salt tablets.

There is no minimum daily requirement or RDA for sodium because the American diet shows no evidence of shortage of this mineral. In fact, the opposite is more likely true. A large portion of the population has elevated sodium levels. For individuals with hypertension, sodium intake should be regulated. ***Hypertension***, or high blood pressure, means that the heart must work much harder to pump the blood. High blood pressure can be hereditary and can be intensified with obesity and too much sodium in the diet.

Due to the increased incidence of hypertension in adults, The National Research Council, Food and Nutrition Board, recommends that healthy adults and children consume no more than 2400 milligrams of sodium per day. Figure 9 lists commonly eaten foods that are high in sodium.

Foods High in Sodium

Food	*Amount*	*Sodium Content (mg)*
Bacon	3 slices	303
Catsup	2 Tbsp.	312
Salt	1 tsp.	2100
Worcestershire sauce	1 Tbsp.	315
Cheese, processed	1 oz.	406
Frankfurter (beef and pork)	1	504
Peanuts, salted	1 c.	626
Pizza, cheese	1 slice	699
Luncheon meat	2 pieces	810
Cottage cheese, small curd	1 c.	850
Soup, canned tomato	1 c.	872
Pickles, dill	1 whole	928
Olives, green	10	936
Burrito, bean	1	1030
Ham, lean	3 oz.	1128
Corn dog	1	1252
Enchilada	1	1332
Smoked Salmon	3 oz.	1700

Source: "Nutritive Value of Foods." *Home and Garden Bulletin No. 72*, United States Department of Agriculture, Revised April 1981.

Figure 9

Reducing Sugar in the Diet.

The average American consumes an estimated sixty to eighty pounds of sugar a year. That is approximately one-fourth pound of sugar per day. One reason for this high intake of sugar could be the amount of hidden sugar found in convenience food items not normally thought of as sweets.

PURE
VERMONT
Maple Syrup

Several carbohydrates are broken down into simple sugars during digestion. These terms often are used on food labels in place of the word *sugar*. Figure 10 lists the most commonly used terms.

Food labels also may have other terms for sugar which include:

- brown sugar
- confectioner's sugar
- corn sweeteners
- corn syrup
- dextrose
- granulated sugar
- high-fructose corn sweeteners
- honey
- invert sugar (glucose and fructose)
- maple sugar
- molasses
- natural sweetener
- raw sugar

Sugar Terms Most Commonly Used on Food Labels

sucrose—	white refined table sugar, brown sugar, confectioner's sugar
fructose—	the most concentrated sweetener (found in fruits); small amounts provide the same sweetening as larger amounts of other sugars
maltose—	malt sugar; found in breads and cereals
lactose—	milk sugar; found in milk and milk products
glucose—	honey, corn syrup

Figure 10

The Dietary Guidelines for Americans found in Appendix F suggests that people increase their intake of complex carbohydrates and decrease their intake of simple carbohydrates. Currently, it is estimated that the typical American consumes 25 percent from complex carbohydrates.

It is recommended that people reduce their simple carbohydrate intake to only 10 percent of total calories and increase their complex carbohydrate intake to 50 percent of all calories. Diets low in pure sugar and high in complex carbohydrates are generally lower in fat and calories and higher in fiber than diets that contain a large percentage of pure or refined sugars.

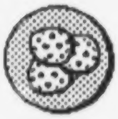
All forms of sugars, as well as all digestible carbohydrates, have four calories per gram. High-sugar foods are not recommended for people who have health problems such as diabetes, obesity, heart disease, and tooth decay.

Figure 11 lists foods that contain simple carbohydrates and those that are classified as complex carbohydrate foods. Foods from the complex carbohydrate list should be chosen as sources of energy and for their valuable vitamins and minerals.

Simple and Complex Carbohydrate Foods

Simple Carbohydrate Foods

cakes
candies
cookies
dried fruits
honey
jams and jellies
pastries
soft drinks
sugars
syrups



Complex Carbohydrate Foods

breads
cereal grains
crackers
fresh fruits
fresh vegetables
legumes
pasta

Figure 11

There is no evidence that a high-sugar diet causes heart disease. The relationship to heart disease occurs because persons with high-sugar diets are often overweight. Obesity is a risk factor for heart disease. Too much sugar in the diet is a factor for tooth decay. Sugary foods create a perfect climate in the mouth for the growth of bacteria that destroys tooth enamel and causes tooth decay.

Consumers must learn to identify sugar in their diets. Strategies for reducing the amount of sugar in the diet include the following:

- Select pure fruit juices rather than soft drinks or imitation fruit drinks.
- Choose unsweetened cereals rather than the presweetened varieties. Learn to read the labels for sugar content.
- Eat fruits canned in natural juices rather than in heavy syrups.
- Reduce intake of "empty calorie" foods. Empty calorie foods contain calories but no nutritional value, such as soft drinks.
- Select fresh fruits for snacks. The sugar content of dried fruits is much higher.
- Try using the sweet spices—allspice, cardamom, cinnamon, cloves, coriander, ginger, and nutmeg—to replace some of the sugar in recipes.
- Be aware that a product is high in sugar if sugar is one of the first three ingredients listed on the label.

Nutrition and Disease

Nutrition plays an important role in the prevention and treatment of certain diseases and health problems. The body's ability to resist disease is directly related to nutritional health.

Nutrients found in food are essential for overall health and well-being. Although nutrients do not cure an illness as medicines do, the well-nourished body is better prepared to fight disease and keep itself healthy. Preventive nutrition is the process of maintaining good health and well-being through good nutrition practices before illness occurs.

The Common Cold.

Many people believe that consuming large amounts of a certain food or taking large doses of vitamin supplements will cure an illness or disease. For many years, it has been rumored that consuming large doses of vitamin C (ascorbic acid) will prevent or cure the common cold. Scientific research indicates that large doses of vitamin C have no effect on the virus that causes colds.

Since vitamin C is a water-soluble vitamin, amounts above the body's daily need is excreted through the urine. However, it has been shown that megadoses of vitamin C above 2 grams can be harmful. Two grams of vitamin C are equivalent to 2,000 milligrams. The U.S. RDA for vitamin C is 60 milligrams. Therefore, a person who take four 500 milligram vitamin C tablets is consuming three and one-half times the recommended amount. The person whose diet meets the minimum daily requirement of nutrients will most likely suffer less severely from colds, and the person will possibly recover sooner.

Cancer.

Research has shown that diet and nutrition are related to cancer in several ways. It is evident that people's eating habits influence their susceptibility to certain kinds of cancer. However, there are many factors involved when considering the cause, prevention, and recovery from cancer. Besides diet and nutrition, genetic and environmental factors are also known to be involved. The challenge for researchers is to continually compare the dietary practices of those persons who get cancer with those who do not. One factor is clear, the risk of developing cancer may be greatly reduced in persons who make wise food choices and eliminate tobacco consumption.

Reduction of cancer risk by diet does not depend on any single factor, but requires an overall change in eating patterns and food preparation methods. The American Cancer Society has recommended the following guidelines for the public.

The American Cancer Society Dietary Guidelines.

1. **Avoid obesity.**
2. **Cut down on total fat intake.**
3. **Include a variety of vegetables and fruits in the daily diet.**
4. **Eat more high fiber foods, such as whole grain cereals, vegetables, and fruits.**
5. **Limit consumption of alcoholic beverages.**
6. **Limit consumption of salt-cured, smoked, and nitrite-cured foods.**

Research on cancer risk and the diet suggests that people modify their food choices using these guidelines so as to reduce their risk of developing cancer. Choosing a wide variety of nutrient-rich foods as well as reducing fat intake and increasing intake of vegetables and fruits is a prescription for healthy eating.

The American Cancer Society has a new comprehensive program that incorporates the most up-to-date educational strategies and information on the links between diet, nutrition, and cancer. This program, "Changing the Course," includes a nutrition curriculum for elementary, intermediate, and secondary students, and a manual for school food service providers.

Diabetes.

Diabetes is a genetic disorder and is not caused by eating too much sugar. Diabetes occurs in an individual whose pancreas does not produce enough insulin to control blood sugar levels. Diabetics must control their dietary intake in order to maintain normal blood sugar levels.

Heart Disease.

It is estimated that more than half of the people who die in the United States each year die of cardiovascular disease. Cardiovascular disease is a term that covers all the diseases of the heart and blood vessels. Most of these deaths can be attributed to atherosclerosis. ***Atherosclerosis*** is an accumulation of lipid plaque within the arterial wall which results in a narrowing of the artery. It is also known as a hardening of the arteries. Lipid is a term used to describe fats, oils, and fat-related substances. Atherosclerosis leads to the closing or blocking of the arteries that supply blood to the heart and brain. Obstruction or blockage in the arteries can cause heart attacks and strokes.

Most people have some plaque in their arteries. The important factor is how advanced the buildup is and what can be done to slow down its progression.

Risk Factors Relating to Atherosclerosis

- **Smoking.** Smoking is considered one of the causes of heart disease. Smoking reduces the level of HDL cholesterol; HDL is the good cholesterol.
- **Gender.** Males are more prone to heart disease than females.
- **Heredity.** Persons with a family history of heart disease and diabetes have a greater risk.
- **High blood pressure.** Also known as hypertension, high blood pressure is a major risk factor in heart disease and strokes.
- **High blood cholesterol level.** It is generally recommended that blood cholesterol levels be lower than 200 milligrams per 100 milliliters of blood.
- **Lack of exercise.** Regular exercise helps control weight, reduces stress, and improve circulation.
- **Obesity.** Obesity causes increased stress on the heart and other organs and increased levels of serum cholesterol.
- **Stress.** There appears to be some link between a person's personality, reaction to stress, and heart disease.
- **Personality characteristics.** Type A behavior. Type A personalities are most generally competitive, resist fatigue, tense, and withhold emotions.

Figure 12

By identifying and controlling the risk factors that are present in one's life, a person can slow the progression of atherosclerosis. Figure 12 lists the risk factors related to atherosclerosis. Good nutrition, along with the other factors, plays an important role in preventing heart disease. Research has shown that it is a combination of the risk factors, rather than just any one in particular, that makes some persons more susceptible to heart disease than others.

The American Heart Association has devised an eating plan that helps lower blood cholesterol levels. The eating plan is based on these American Heart Association dietary guidelines:

- Total fat intake should be less than 30 percent of calories.
- Saturated fatty acid intake should be less than 10 percent of calories.
- Polyunsaturated fatty acid intake should be no more than 10 percent of calories.
- Monounsaturated fatty acids make up the rest of total fat intake, about 10 to 15 percent of total calories.
- Cholesterol intake should be no more than 300 milligrams per day.
- Sodium intake should be no more than 3000 milligrams (3 grams) per day.

The American Heart Association "Eating Plan Tips" are shown in Figure 13.

Eating Plan Tips

To control the amount and kind of fat, saturated fatty acids, and dietary cholesterol you eat:

- **Eat no more than 6 ounces (cooked) of lean meat, fish, and skinless poultry per day.**
- **Try main dishes featuring pasta, rice, beans, and/or vegetables. Or create "low-meat" dishes by mixing these foods with small amounts of lean meat, poultry, or fish.**
- **The approximately 5 to 8 teaspoon servings of fats and oils per day may be used for cooking and baking, and in salad dressings and spreads.**
- **Use cooking methods that require little or no fat—boil, broil, bake, roast, poach, steam, saute´, stir-fry, or microwave.**
- **Trim off the fat you can see before cooking meat and poultry. Drain off all fat after browning. Chill soups and stews after cooking so you can remove the hardened fat from the top.**
- **The 3 to 4 egg yolks per week included in your eating plan may be used alone or in cooking and baking (including store-bought products).**
- **Limit your use of organ meats such as liver, brains, chitterlings, kidney, heart, gizzard, sweetbreads, and pork maws.**
- **Choose skim or 1% fat milk and nonfat or low-fat yogurt and cheeses.**

To round out the rest of your eating plan:

- **Eat 5 or more servings of fruits or vegetables per day.**
- **Eat 6 or more servings or breads, cereals, or grains per day.**

Reprinted with permission.

©The American Heart Association, 1991

Figure 13

Along with the dietary changes for reducing the risk of coronary heart disease, other lifestyle changes also reduce the risk. These are identified in Figure 14.

Lifestyle Changes that Reduce the Risk of Heart Disease

- **Stop smoking.**
- **Reduce blood pressure through diet or medication.**
- **Reduce body weight if needed.**
- **Increase exercise and activity.**
- **Reduce stress and enjoy life.**

Figure 14

As research concerning the relationship of diet, exercise, and coronary heart disease continues, people must stay informed of the latest findings, and in the meantime, take a rational approach to modifying their diet. The recommendations from the health professionals seem to be that persons who do not suffer from any particular health problem should choose a healthful diet by eating a variety of foods in moderate amounts that supply their daily nutrient requirements. This practice will ensure a lifetime of healthy eating.

Americans are striving to become a healthier population. More people than ever before are taking an interest in their nutritional and overall health and well-being. Hopefully, this will lead to a drastic reduction in the number of deaths from cardiovascular disease.

CULTURAL ASPECTS OF FOOD

Cultural, societal, and religious laws have great influence on all aspects of food consumption. ***Society*** refers to a group of people who share a common culture and live within a common region. ***Culture*** refers to the beliefs, traditions, and values that are shared by the people within a society. In the American society, citizens depend on advances in science and technology to continually improve the way food is produced, harvested, and transported. However, within the American society there are subcultures that restrict the use of certain types of food. For example, the Amish culture restricts the use of advanced technology in producing, harvesting, or transporting food for the Amish people.

Within all societies, many different cultural laws affect food consumption. In some instances, governments restrict the import or production of certain foods due to cultural or religious beliefs. In most societies, food is used as a symbol of love, affection, and social ties to family and friends. These food traditions serve to strengthen family and social relationships.

In all societies, food has been used to distinguish social class and to symbolize wealth and prestige. Many pregnant and nursing women avoid eating certain foods because they believe the foods cause harm to the unborn child. The cultural beliefs, traditions, and values of people within societies determine the customs for how food is used.

Religious Customs

Religious beliefs within societies influence the many rituals and customs surrounding food. Some societies believe that avoiding certain foods protects them from harm. Some religions have customs surrounding the consumption of certain foods during religious holidays or special holy days. Many religious ceremonies are accompanied by feasts with family members and friends. In the United States, religious ceremonies such as baptisms, weddings, and funerals are usually followed by a gathering involving food.

NUTRITION ISSUES

Americans are living in the midst of an "information explosion." Every day new information is presented to consumers to be digested, assimilated, or rejected. With all of this wealth of information to be considered, it is not surprising that many consumers have experienced "information overload" and need guidance in sorting fact from fiction. The science of nutrition is deeply involved in this "information explosion." Currently, there are some nutrition issues that seem to be concerns of many consumers. These issues include eating disorders, fad diets, vitamin/mineral supplements, nutrition labeling, weight control, and physical fitness.

Eating Disorders

Eating disorders, primarily anorexia nervosa and bulimia nervosa, are diseases that are characterized by a preoccupation with weight loss and thinness. These disorders can have damaging effects on the physical and mental health of the persons plagued by them. Compulsive overeating is also recognized as an eating disorder.

Anorexia Nervosa.

In an affluent society where food is plentiful, an illness known as anorexia nervosa affects almost one out of every 100 young women. ***Anorexia nervosa*** is an eating disorder characterized by an obsessive and compelling desire to be thin. Out of every twenty young people with this disorder, nineteen of them are female. This disorder resembles an addiction because the person becomes totally obsessed with weight loss and a lifestyle of self-prescribed starvation takes over. This self-imposed starvation slowly begins to affect the person's personality and ability to think rationally. Many times this obsession with thinness causes the person to resort to excessive exercise in combination with the starvation. This can result in serious bodily injury because the body has not been supplied with the energy and nutrients needed. Physical symptoms of anorexia nervosa are shown in Figure 15.

One of the consequences of malnutrition secondary to anorexia nervosa is anemia. Anemia is a condition in which the blood cannot transport oxygen to the cells in the body. This is caused by a shortage of red blood cells or the presence of abnormal ones. Anemia is often a result of nutritional deficiencies and other diseases.

Physical Symptoms of Anorexia Nervosa

- *Deterioration of the body; especially muscle wasting and inadequate fat stores*
- *Menstruation stops in females; impotency occurs in males*
- *Skin assumes dry, yellowish tint*
- *Low blood pressure*
- *Heart function becomes inefficient due to the effect of starvation on hormones that regulate blood pressure*
- *Excessive hair growth on the body (possibly for warmth)*
- *Anemia*
- *Interrupted sleep patterns; bad dreams*
- *Feels fat (distorted perception)*

Figure 15

The treatment for anorexia nervosa is threefold. First, it involves medical personnel in the diagnosis and treatment of the medical complications that arise from prolonged starvation. Second, the treatment involves psychiatric or psychological personnel identifying and treating the underlying psychological problems which manifest as severe eating disorders like anorexia nervosa and bulimia nervosa. Third, the dietitian provides nutrition counseling for the patient to help with maintaining a balanced, nutritious diet.

Bulimia Nervosa.

Bulimia nervosa is another eating disorder that has plagued our affluent society since it was first recognized as a medical disorder in 1980. It is similar to anorexia in that it seems to strike mostly young women who have an obsession with an unrealistic perfect body. Some characteristics of people with bulimia include:

- They participate in binge eating followed by purging. Purging is an attempt to remove food from the body either by self-induced vomiting or the continual use of laxatives.
- They are successful and desire perfection.
- They turn to food in a crisis.
- They have a history of dieting and weight gain during the teen years.
- They binge and purge secretly.

Bulimia nervosa is an eating disorder characterized by self-induced vomiting following binge eating. Binge eating is the overindulgence of food without control or rational judgment about the amount being consumed. Sometimes a person with bulimia uses laxatives, diuretics, fasting, and excessive exercise to rid his or her body of what is thought to be harmful. These binge/purge cycles are not in response to hunger, but rather a compelling need by the person with bulimia to rid his or her body of food that might cause weight gain. Bulimic behavior is sometimes brought on by family stress or feelings of rejection. Characteristics of a person with bulimia are low self-esteem, social anxiety, depression, isolation, and difficulty with interpersonal relationships. Figure 16 lists the dangerous effects of bulimia.

Dangerous Effects of Bulimia Nervosa

- *irritation of the esophagus*
- *abnormal heart rhythms*
- *injury to the kidneys*
- *bladder and kidney infections, possibly causing kidney failure*
- *lacerations or tears to the stomach, caused by excessive vomiting*
- *tooth decay*
- *malnutrition*

Figure 16

The treatment for bulimia nervosa is similar to that of anorexia nervosa because it involves the assistance of medical, psychological, and dietetic personnel. Through nutrition counseling, psychotherapy, and medical therapy, the bulimic patient can regain a new sense of self-worth and learn ways to control the need for binge eating. However, our society must change its attitude toward the unrealistic images of perfect people with perfect bodies that are expressed through the media.

It is imperative that positive messages of respect and value for each individual's unique qualities and talents replace those negative messages currently seen by the young people of the affluent nations. Ideally, this type of societal change would greatly reduce the number of victims of anorexia nervosa and bulimia.

Weight Control

Consumers as well as nutritionists and physicians are continually being challenged with maintaining ideal weight throughout adulthood.

Research has shown that serious overweight problems lead to many health problems such as coronary heart disease, diabetes, gall bladder disease, high blood pressure, respiratory problems, and stroke. Overweight people also face problems with fatigue and degenerative arthritis.

Once a person has a serious weight problem, finding solutions to weight loss become increasingly more difficult. It is definitely more difficult to lose excess weight than it is to maintain ideal weight in the beginning. Weight loss will only occur as a result of expending more calories through exercise and activity than is consumed through food. Most generally eating habits and behavior must be changed in order to maintain the ideal weight once the excess weight is lost. This requires self-discipline and is difficult, but it also restores self-esteem, self-confidence, and gives a feeling of accomplishment.

Fad Diets

Americans look for quick and easy fixes to the overweight problem. These quick fixes or "fad diets" cause their followers many disappointments, such as:

- disillusionment
- loss of money
  (from purchasing products, equipment, *remedies*, etc.)
- unsuccessful weight loss
- weight gain with an increase of body fat

These fad diets fail because they are not generally nutritionally balanced, are unhealthy, and provide only a temporary solution to a permanent problem. They do not follow sound nutritional practices or change life-long eating habits.

On the other hand, effective diet plans that are prescribed and conducted under the supervision of registered dietitians and physicians provide the overweight individual with a much better chance at success. Some characteristics of effective diet plans include:

- nutritionally balanced meal plans
- methods for teaching new eating habits
- menus that offer choices of a wide variety of foods
- meal plans that include a balance of calories (the recommended proportion of carbohydrate, fat, and protein)
- satiety value which keeps the person feeling satisfied and delays hunger for a period of time
- an average of 1200 calories per day for adult women and 1500 calories per day for adult men (less than 1,000 calories per day will not provide the needed nutrients and will most likely leave the person feeling tired and hungry)

Weight control and weight loss in children and adolescents must be carefully monitored by physicians. Due to the rapid growth and development than occurs during these years, it is imperative that any weight loss programs for children and adolescents be prescribed and supervised. Rapid weight loss and calorie restriction in children and adolescents can cause serious health hazards.

Vitamin and Mineral Supplements

Americans spend billions of dollars in vitamin supplements. Many people use vitamin-mineral supplements because they feel their fast food and snack food diets are inadequate in providing the essential nutrients.

Vitamins work cooperatively with each other and with other nutrients to perform their functions in the body. Therefore, the best way to meet the daily need for nutrients is through a balanced diet that contains a wide variety of foods.

By law, all vitamins must have the same chemical formula, whether they are *natural* or *synthetic*. Natural vitamins are made with extracts from foods. Synthetic vitamins are chemically formulated. The human body cannot distinguish one from the other, so it is not necessary to purchase the more expensive *natural* vitamins.

There are some people who do have vitamin and mineral deficiencies and need to take nutrient supplements. Some people who may be at risk for deficiencies include:

- pregnant and lactating women
- elderly persons with inadequate diets
- persons recovering from burns, injuries, or surgery
- children and adolescents with inadequate diets
- persons with chronic illnesses
- individuals with gastrointestinal malabsorption problems
- alcoholics

In most circumstances, vitamins taken in excess are of no value. Megadoses of vitamins A (retinol) and D (calciferol) can cause serious health problems. Fat-soluble vitamins such as A and D that are not used by the body are stored in fat. This makes a buildup of these vitamins more likely and more toxic. Water-soluble vitamins not used by the body are excreted in the urine, making it less likely for toxic levels to occur.

Labeling

The Nutrition Information Panel is the term used to describe the nutrition content information that is printed on food labels. Nutritional labeling guidelines were first established by the Food and Drug Administration in 1938. In 1967, the Fair Packaging and Labeling Act required that all labels on packaged foods contain four important facts.
These include:

1) identity of the food
2) the name and address of the manufacturer, packer, and distributor
3) net contents (actual weight without the package) of the product
4) ingredients must be listed on a single panel with the common names of the ingredients appearing in decreasing order of weight if no standard of identity has been established

The FDA is in the process of amending the food labeling regulations. Some problems that have occurred because the labels are not currently standardized include:

- Many labels omit cholesterol information
- Many labels fail to specify carbohydrates as starch or sugar
- The fiber content is often omitted
- Many labels fail to specifically identify the oils used

Increased scientific knowledge about the relationship between health and certain food components such as cholesterol, fats, fiber, and sodium has prompted the FDA to update the labeling laws. These changes were also influenced by the growing public interest in the nutritional status of food products. The new labeling will be required on almost all packaged foods as well as fresh fruits, vegetables, and fish. These new labeling regulations also may be required of restaurants. Restaurants and fast-food establishments may be required to place nutrition information on menus or have the information accompany the food in some written form.

Sources of Reliable Nutrition Information

A variety of resources are available to provide the consumer with reliable nutrition information. Amidst the enormous amount of diet and nutrition information presented by the media, it is sometimes difficult for consumers to distinguish fact from fallacy. In teaching nutrition education to children, adolescents, and adults, it is important to depend on reliable sources for nutrition information.

Some reliable resources pertaining to food science and nutrition include information from these organizations:

- American Cancer Society
- American Diabetes Association
- American Dietetic Association
- American Heart Association
- Food and Drug Administration
- National Council Against Health Fraud, Inc.
- Texas Agricultural Extension Service
- Texas Department of Health and Human Services
- United States Department of Agriculture
- city health departments
- educational programs, including classroom instruction and textbooks
- professionals, such as registered dietitians, university nutrition professors, and home economists
- professional journals

Publications in professional journals as well as other periodicals provide current information on nutrition. Some of the professional journals include:

- *Critical Reviews in Food Science and Nutrition*
- *Food Science and Nutrition*
- *Journal of the American Dietetic Association*
- *Journal of Food Science*
- *Journal of Nutrition*
- *Journal of Nutrition Education*
- *Nutrition Today*
- *School Food Service Journal*

Along with the professional journals, there are a variety of newsletters that disperse reliable nutrition information. They are published by organizations, medical facilities, consumer agencies, and large corporations that have food science and nutrition related products. Some of the available food and nutrition newsletters include:

- *Consumer Reports Health Letter*
- *Dairy Council Digest* by the National Dairy Council
- *Food Insights* by the International Food Information Council
- *Food and Nutrition News* by the National Live Stock and Meat Board
- *Harvard Health Letter* published by the Harvard Medical School
- *Lifetime Health Letter* published by the University of Texas Health Science Center at Houston
- *Mayo Clinic Health Letter*
- *Nutrition and Health News* by the University of Texas Southwestern Medical Center at Dallas
- *Nutritional News and Views* published by Mead-Johnson
- *Tufts University Diet and Nutrition Newsletter* published by the Tufts University School of Nutrition
- *Nutrition Action Newsletter* published by the Center of Science in the Public Interest

Much nutrition information is disseminated through the media. For many Americans, the media is their greatest resource for current information. However, not all information conveyed through the media, especially that related to advertisements for various products, is completely accurate or reliable. This makes it difficult at times to distinguish between the reliable and the unreliable. The best assurance for verifying the accuracy of nutrition information is to confirm the information through one or more of the reliable resources available.

REFERENCES

Gershoff, S. and Whitney, C. *The Tufts University Guide to Total Nutrition.* New York, New York: HarperPerennial, 1990.

Hays, T.G. and Perrin, L.K. *Advanced Food Science and Nutrition.* Home Economics Curriculum Center, Texas Tech University, 1991.

Wardlaw, G.M. and Insel, P.M. *Perspectives in Nutrition.* St. Louis, Missouri: Times Mirror/Mosby Cosby Publishing, 1990.

Whitney, E.N., Hamilton, E.M.N. and Boyle, M. *Understanding Nutrition,* 4th ed. St. Paul, Minnesota: West Publishing Company, 1987.

Education
for
Self-Responsibility IV:

NUTRITION EDUCATION

GRADE 9 - GRADE 12

TEXAS EDUCATION AGENCY

ESR IV

LESSON OBJECTIVE

Identify nutrients, their sources, and their functions.

ASSESSMENT CRITERIA

- Recognize the importance of apples in the diet.
- Draw different forms of apples.

Fine Arts **High School**

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Place a container of apples, either real or artificial, on a table in front of the class.

Discuss the following information with the students:
- Why are apples a popular fruit?
  Apples are available year round; not very messy to eat; and good for children and adults.
- What types of apples are available?
  Cortland, Granny Smith, red and golden delicious, Rome, Jonathan, and McIntosh are some of the varieties available.
- What nutrients are in apples and what are their functions?
  - ° potassium: - helps maintain water balance
    - helps maintain normal muscle action, including the heartbeat
    - helps nervous system work properly
  - ° insoluble fiber: - makes it easier to eliminate wastes
    - helps prevent hemorrhoids and diverticulitis
  - ° pectin: (soluble fiber) - linked to lowering cholesterol levels

Discuss the many different ways that apples may be used. Some examples include:
- applesauce
- apple bread
- apple cake
- apple juice
- apple pie
- caramel apple
- baked apple
- fruit salad

Display some of the pictures of apples.

Instruct the students to draw at least three forms of apple products. Allow students to select their own style of drawing—abstract, realistic, impressionistic, pointillism, cubism.

After completion, ask some students to show and describe their drawings to the class.

RESOURCES & MATERIALS

Art supplies
Examples of apples in art
Pictures of examples of different forms of apples from magazines
Container of apples, either real or artificial

Ask the cafeteria manager for permission to display the artwork in the cafeteria.

ESSENTIAL ELEMENT

Fine arts. Art I. Inventive and imaginative expression through art materials and tools. The student shall be provided opportunities to work in art areas of design, drawing, painting, printmaking, and sculpture.

LESSON OBJECTIVE

Discuss the Dietary Guidelines for Americans.

ASSESSMENT CRITERIA

Analyze the Dietary Guidelines for Americans and their effect on the student's health.

ACTIVITIES & STRATEGIES

Divide the class into seven groups.

Distribute copies of "Appendix F: Dietary Guidelines for Americans."

Discuss these guidelines briefly with the students. Explain that America is considered a land of plenty, yet many Americans are ***malnourished***. As the students prepare this assignment, ask them to consider how these dietary guidelines can help them make healthier choices.

Instruct students in each group to write a skit about an assigned dietary guideline, including the following information:
- Identify the dietary guideline with cue cards or include the name of the guideline in the skit.
- Examine the purpose of the dietary guideline.
- Analyze the effects on health if the dietary guideline is followed.
- Analyze the effects of a nutrient deficiency if the dietary guideline is not followed.
- Demonstrate ways this guideline could be incorporated into the daily diet.

Assign students to practice the skit and then present the skit to the class and possibly to elementary students.

Instruct the students to evaluate their diets with the "Appendix F: Dietary Guidelines for Americans." Tell them to draw some conclusions and summarize in writing the ways which they could improve their diets in relation to each of the "Dietary Guidelines for Americans."

Fine Arts **High School**

HS

TEXAS EDUCATION AGENCY

RESOURCES & MATERIALS

Handout: "Appendix F: Dietary Guidelines for Americans"

"Heart Challenges," American Heart Association Schoolsite Program, High School

TEACHER TIPS

- **Two class periods may be needed for this activity, depending on the size of the class.**
- **Consider doing this activity in March during National Nutrition Month.**
- **Check with the elementary principal about the presentation of the skit by the high school students.**

Check with the cafeteria manager about displaying a guidelines poster in the cafeteria.

ESSENTIAL ELEMENT

Fine arts. Theatre arts II, III, IV. Theatre production concepts and skills. The student shall be provided opportunities to develop playwriting techniques.

Fine Arts **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Explore the influence of food advertising and the media on food habits.

ASSESSMENT CRITERIA

Analyze how food advertisements in the mass media influence our food choices.

ACTIVITIES & STRATEGIES

Present this information to the students:
- Mass media such as television, radio, magazines, and newspapers can affect one's food selections.
- The mass media introduces new food products and reminds us about certain types of food.
- Mass media appeals to your curiosity, your appetite, your desire to belong, and your sense of pride. The mass media also provides coupon rebates and special introductory offers.

Divide the class into groups. Assign each group to plan, write, and perform a short television advertisement for a food product.

Videotape the students as they perform the advertisements.

Play the videotape for the class and evaluate the skits.

How does the advertisement:
- inform the buyer?
- introduce a new product?
- appeal to your curiosity?
- appeal to your appetite?
- appeal to your desire to belong?
- appeal to your sense of pride?
- influence you to buy the product?
- provide truthful information?

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

High School Nutrition Music Video Contest (demonstration kit free) Mail to:
Nutrition Music Video Contest
Florida Department of Citrus
2755 E. Oakland Park Boulevard
Ft. Lauderdale, FL 33306

Video camera and tape
VCR and television

TEACHER TIP

Two class periods may be needed to complete this activity.

ESSENTIAL ELEMENT

Fine arts. Theatre arts I. Expressive use of the body and voice. The student shall be provided opportunities to practice stage movements and develop voice and diction.

LESSON OBJECTIVE

Explore the influence of food advertising and the media on food habits.

ASSESSMENT CRITERIA

Analyze the methods that advertising agents use to influence our food selections.

Fine Arts **High School**

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Ask the students to give examples of advertising and determine the methods being used by the advertisers.

When we turn on the television, listen to the radio, read our mail, drive down the highway, or read a newspaper or magazine, we are confronted with advertising.

Good advertisements are informative, but advertising can also persuade us to buy things that we do not need. An informed shopper will learn to read advertisements for information and to recognize and resist appeals.

List these methods used in advertising on the chalkboard:
- information and misinformation
- entertainment
- giveaway
- status
- peer approval
- good taste
- hero endorsement
- sexual attraction
- intelligence
- independence
- being part of a group
- testimonial
- impossible results

Discuss with students the meaning of the listed methods of advertising. Show examples of different advertising techniques to the students, and discuss their appeal.

Assign students to select one method of advertising and a food, nutrient, or fitness equipment product. Tell them to create an original poster of an advertisement to persuade people to buy their product.

RESOURCES & MATERIALS

Choose Well, Be Well. California State Department of Education. Sacramento, California, 1984

"Heart Challenges," American Heart Association Schoolsite Program, High School

Paper or poster board
Art materials
Examples of advertisements

In advance, check with the cafeteria manager about displaying the posters in the cafeteria.

ESSENTIAL ELEMENT

Fine arts. Art II. Inventive and imaginative expression through art materials and tools. The student shall be provided opportunities to design, develop, and create original artworks.

Fine Arts **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Describe the relationship between nutrition and the prevention and treatment of health problems (cancer, common cold, diabetes, heart disease, PKU).

ASSESSMENT CRITERIA

Identify health problems that may be caused by poor nutritional habits.

ACTIVITIES & STRATEGIES

Discuss the following information:

- ***Cardiovascular disease*** is a term that covers all the diseases of the heart and blood vessels. Most deaths resulting from the disease can be attributed to ***atherosclerosis***, or a hardening of the arteries, characterized by a thickening of artery walls with plaque.
- ***Plaque*** is an accumulation of lipid matter or fats on the inner walls of the arteries.
- An overabundance of ***cholesterol*** and saturated fat in the diet can contribute to ***atherosclerosis*** .

Distribute the handout, "Polly and the Peddlers," to the students. Choose the characters and begin reading the play. Other students may respond to the characters with a boo, a hiss, a yea, or any other melodramatic cues.

Ask the students the following questions:

1. What is the importance of preventive nutrition? (It helps the body maintain good health and well-being.)
2. Why is Polly so concerned about eating foods that contain large amounts of salt? (A diet high in salt may lead to hypertension.)
3. Describe the relationship between eating a high-fat diet and cardiovascular disease. (High-fat diets may lead to atherosclerosis that can cause heart attacks or strokes.)
4. What can you interpret as the main problem of eating foods like candy bars, jelly beans, and bubble gum after reading Polly's response to Jess' suggestions for snacks? (Eating foods containing excessive amounts of sugar may lead to tooth decay.)

Brainstorm and list several food items that might be considered nutritious snacks. Consider foods that do not contain high amounts of fat, sodium, or sugar. Compare these foods with those that are less nutritious. Evaluate the changes needed in the diet of the average teen to accommodate such healthy food choices.

RESOURCES & MATERIALS

Handout: "Polly and the Peddlers"

"Heart Challenges," American Heart Association Schoolsite Program, High School

---

ESSENTIAL ELEMENT

Fine arts. Theatre arts II, III, IV. Acting concepts and skills. The student shall be provided opportunities to utilize advanced characterization.

Polly and the Peddlers

Characters: **Narrator**
Polly Purebody — a lovely, sweet teenager
Vex Vendo — a handsome, dashing, dangerous vending machine
Fast Food Fats — a sloppy, slick, and sneaky fast food restaurant
Junk Food Jess — a pushy, pesky, pretentious convenience store

Narrator: Our play begins as Polly Purebody, a high school senior, steps out of her last class of the day. She is busy looking through her purse for something, as she walks by three salespersons who are trying to tempt her into buying food. She is aware that nutrition plays an important role in the prevention and treatment of certain diseases and health problems. She knows that her body's ability to resist disease is directly related to nutritional health. She is aware that ***nutrients*** found in food are essential for overall health and well-being. Although nutrients do not cure an illness as medicines do, she knows that a well-nourished body is better prepared to fight disease and keep itself healthy. She is very interested in ***Preventive nutrition*** and sees it as the process of maintaining good health and well-being through good nutritional practices before illness occurs. Let's listen in as Polly Purebody begins her long walk home past those who would like to tempt her into eating foods that are less nutritious than other foods she might choose for an after school snack.

Polly: (humming sweetly to herself, looking in her purse for something as she walks past Vex Vendo)

Vex: (talking in a low voice with a persuasive tone) Pssst. Hey lady, come here. I think I have something you might want.

Polly: (looking a bit concerned and scared, yet with a brave voice) Nothing you have could possibly interest me.

Vex: Take a second look, miss! Salted nuts, potato chips, corn chips......

Polly: I shall not look! I have made a vow that only healthful, nutritious foods shall pass these lovely rose-like lips.

Vex: (exasperated) Oh, please! Don't tell me that you never indulge in a little ....."pleasure."

Polly: Dear sir, pleasure for me is being healthy and strong. You may not believe it, but if I ate foods containing high amounts of salt, I may end up with hypertension !

Vex: Hypertension. Hypertension is good, isn't it?

Polly: (surprised) Hardly! ***Hypertension***, or high blood pressure, means that the heart must work much harder to pump the blood. High blood pressure can be hereditary, a result of obesity, or a result of too much salt in the diet. What you want me to eat contains high amounts of sodium. I care about myself and my body too much to eat foods that may eventually lead to a heart attack or a stroke.

Vex: (looking past Polly) Hey, hey, beat it, you little *ray of sunshine*. I see a potential customer, and I know you are a lost cause. Beat it, I said! Get lost! Leave already!

Polly: (continuing on her way, passing Fast Food Fats, she continues to hum, and look in her purse.)

Fats: (with a very low, gruff voice) Look my way, lovely miss.

Polly: (jolted, looking around, eyes landing on Fats) Oh, it's you. What do you want?

Fats: (winking) Well, it's not what I want, sweet thing. It's what you want that causes me to speak with you.

Polly: (annoyed) I hardly know you; you've got a lot of nerve to call me *sweet thing*!

Fats: (apologetic) So sorry, young lady. I meant no harm. It's just that I am so delighted to share with you some delectable foods you might choose for a snack this day.

Polly: (pessimistic)All right, let's see what you have. Apples? Fruit juice? Whole wheat toast?

Fats: (Laughing out loud) Dear young lady, I hardly call that food. No... what I have in mind is far more interesting. How about some French fries or onion rings. Maybe a fried fish sandwich with extra sauce......

Polly: (determined, defensive, and loud)
How dare you promote such artery clogging, high-fat, high-***cholesterol*** foods!
Don't you have any idea what a steady diet of such foods can do to your circulatory system? An overabundance of cholesterol in the diet can contribute to ***atherosclerosis***. It is estimated that more than half of the people who die in the United States each year die of cardiovascular disease. With cardiovascular disease the blood supply to the heart or brain becomes closed or blocked and the next thing you know you could be clutching your chest, and it won't be because you are saluting the flag! You could be having a heart attack, unless of course a stroke gets you first!

Fats: (looking around, trying to silence Polly, hoping no one else can hear her) Shhhhhh!!!!
Please!!! Do you want to ruin all of my business?! Now you know that many people survive heart attacks, and not all of them are caused by fat in the diet.

Polly: (makes a statement and begins to leave) Not all of them are caused by fat in the diet, that is true, but it is a contributing factor, so if you don't mind, I would like to be on my way. (begins to hum again, looking in her purse, while passing Junk Food Jess.)

Jess: (whiny and annoying) I heard what you said to the others. So of course you wouldn't want to see what I have.........well.....why don't you just take a look, come on, just take a look, look, look, look, look, look.

Polly: (stops, aggravated) All right already! What do you have?

Jess: (whimpering) Now you know that what I have will not cause "atherio" whatever. What I have is wonderful. It will boost your energy level, give your teeth something to work on, and taste delicious all at the same time. Candy bars, jelly beans, bubble gum......what more could you want?

Polly: (provoked) My teeth at the age of twenty!

Jess: (giving up, and looking past Polly) Well, I can see I won't get anywhere with you.......do you mind getting out of my way? I see someone coming.

Polly: (moving past Jess, continuing to look in her purse) At last, I found what I was looking for. (Pantomiming peeling a banana, she begins to eat it.)

Fine Arts **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Discuss family food preferences.

ASSESSMENT CRITERIA

Design an artwork that represents a special food or meal shared with the family.

ACTIVITIES & STRATEGIES

Ask students to define these terms:
- *family*
- *culture*
- *family food preferences*

Discuss with the students the following information regarding the concept of family:
- There are many different combinations of family members that can be identified as family.
- Family means different things to different people.
- Some families do not include a mother and a father.
- Persons do not have to be related by blood or adoption to be called family, for example, foster families.
- A family could include people with whom an individual has a significant relationship like special neighbors, or friends at an organization, church, or club.

Instruct students to create an artwork depicting a special meal, food, or holiday that they have shared with their family. Tell students to include images of foods that made this occasion special, and reflect the mood of the event through color, form, value, and other elements of art.

After completion, ask some students to present their artwork to the class and give a brief description of the depicted event.

RESOURCES & MATERIALS

Art materials

In advance, ask the cafeteria manager for permission to display the artwork in the cafeteria.

ESSENTIAL ELEMENT

Fine arts. Art I. Inventive and imaginative expression through art materials and tools. The student shall be provided opportunities to design, develop, and create original artwork.

Fine Arts **High School**

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Discuss factors affecting the world food supply.

ASSESSMENT CRITERIA

Represent one factor that affects the world food supply in a drawing.

ACTIVITIES & STRATEGIES

Show a slide or photograph of the painting, "The Gleaners," and ask the following questions:

- What type of people must glean for their food? (poor peasants)
- Why did the artist contrast the meager amount of wheat picked up by the gleaners with the abundance of the harvest represented in the background? (to emphasize the difficult struggle that the peasants had in obtaining food in a land of plenty)
- The gleaners in this area of France had to be licensed to pick up food. What images in the painting suggest the inequities towards the rural poor at that time? (The contrast of much and little; the way the women are separated from the harvest is symbolic of those who have been alienated.)
- How might these images have provoked fear of social dissension? (Viewers may have recognized the poverty of those on the fringes of society.)
- This painting represents one of the complex problems involved in providing food for the world population: politics. The poverty of the people represented in the painting was not a priority with the community, or these gleaners would not have had to work so hard for so little.

Distribute the handout, "Factors Affecting the World Food Supply." Review and discuss the information as a class.

Inform the students that they are to represent one of the factors in a drawing. Encourage them to think about the individuals that are affected by these factors. Tell students to represent the mood and emotion of these people in their drawings.

RESOURCES & MATERIALS

Handout: "Factors Affecting the World Food Supply"

Slide or photograph of a painting by Jean Francois Millet, *The Gleaners*, 1857. Approx. 33" X 44". Louvre, Paris

Slide projector
Drawing pencils and paper

ESSENTIAL ELEMENTS

Fine arts. Art II. Inventive and imaginative expression through art materials and tools. The student shall be provided opportunities to design, develop, and create original artworks.
Fine arts. Art II. Understanding and appreciation of self and others through art culture and heritage. The student shall be provided opportunities to appreciate art (contemporary and of the past) and see art and artists (visitations and visuals).

Factors Affecting the World Food Supply

Limited World Food Production

It is estimated that by the year 2000, the world's population will reach six billion, and 80 percent of these people will live in the developing countries. The developing countries are the nations with severe economic problems that are working to become more industrialized. These countries must increase food production, work toward reducing the rate of population growth, and increase economic development. The developed countries will have to assist these countries in domestic agricultural reform.

Limited Nutrition Education

Lack of education concerning nutritional needs for good health is a factor in the many problems associated with hunger and malnutrition. ***Hunger*** or ***undernutrition*** is a state of weakness caused by the need for food. It occurs when the body lacks nourishment. ***Overnutrition*** is the intake of excessive amounts of food that leads to overweight and obesity. Nutrition education is important because often the food needed for a balanced diet is available, but people choose other items because they lack the education and information to make wise food choices based on nutritional needs.

Traditional Value Systems and Social Organizations

Many people feel that if the poor people of developing countries had fewer children, there would be more food. It is true that when there are more people to feed, a smaller amount of food will be available for each one. However, for people living in poverty, having many children is a means of survival. The high infant mortality rates in developing countries means that families can expect only a few of their children to reach adulthood. In those countries, children are needed to help earn extra income for the family and to take care of their parents in old age.

Land Ownership and Tenure Relationships

In many countries, ***tenure relationships*** exist between landowner and farmer. Tenure relationships are agreements between the landowner and the farmer whereby the farmer pays the landowner money, crops, or both in order to farm his land. Farmers who farm their own land face strict government policies that limit crop process and reduce available credit.

Political Climate

Very few countries have institutions or organizations whose goals are to end world hunger. Many developing countries fall behind in technology and production because they do not place much emphasis on agricultural development. In many poor countries, the government officials and politicians are not even aware of the hunger problems in their own countries. They exclude themselves from exposure to the poor people who have no political voice.

Lack of Income

Individuals and families who live in poverty face many overwhelming obstacles such as: a lack of land on which to grow their own food; a lack of funds to purchase farm equipment if they do own land; and a lack of funds to purchase nourishing food. Poverty and hunger cause illness and weakness that prohibit people from holding jobs that could produce income to buy food.

Lack of Proper Transportation and Storage Facilities

Developing countries lack modern facilities for storing and distributing the crops that they raise. The absence of modern farm equipment and supplies, poor roads, and limited access to trucks and other means of transportation inhibit the distribution of food. Poor storage conditions invite insects and pests that destroy a large percentage of harvested crops.

Customs, Superstitions, and Religious Influence

Superstitions about food products exist in many cultures of developing countries. People living in these cultures believe that consuming certain foods brings evil or hardship to a family. Even though they might be hungry and malnourished, the people in these countries do not eat certain foods that might provide proper nutrition because of cultural or religious reasons.

Illiteracy

In the countries where the population continues to grow at a rapid rate, a large percentage of those reaching adulthood are illiterate. These countries do not have the funds or facilities to provide for education of the population. With the ability to read and write comes the ability to obtain better jobs and to learn about the importance of good nutrition and health.

LESSON OBJECTIVE

Analyze the economics of good nutrition.

ASSESSMENT CRITERIA

Analyze the costs of good nutrition versus poor health.

Fine Arts High School

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Compare the signs of good nutrition with those of poor nutrition.

Signs of good nutrition:
- an optimistic attitude
- ideal weight for height and age
- ability to cope with everyday life
- healthy teeth and gums
- ability to work
- good attendance on the job or at school with few accidents
- erect posture
- clear and smooth skin
- shiny and healthy hair
- clear and bright eyes

Signs of poor nutrition:
- depressed, tired
- lives in a world of fantasy
- overweight or underweight
- body slumps
- scaly, poor skin color; sores do not heal
- dull, brittle hair which breaks easily
- bleeding gums, pain and cavities in teeth
- sore, red, and itchy eyes
- lacks energy
- poor attendance at work or school with frequent accidents

Ask students about some of the costs of poor nutrition.
- inability to keep a job
- catch colds and other infections easily
- cannot sleep well
- costs of doctor bills
- chronic illness such as heart problems, cancer, and diabetes

Ask the students to contrast good nutrition and poor nutrition in a dual figurative composition. Reflect the art elements of color, form, and value. Additional elements could be used if desired.

Allow students to select their own media from the available materials.

RESOURCES & MATERIALS

Art materials

TEACHER TIP

Advise the students that other factors also influence appearance and mental health.

In advance, ask the cafeteria manager for permission to display artwork in the cafeteria.

ESSENTIAL ELEMENTS

Fine arts. Art III. Awareness and sensitivity to natural and man-made environments. The student shall be provided opportunities to explore elements (line, value, texture, color, form, and space).
Fine arts. Art III. Inventive and imaginative expression through art materials and tools. The student shall be provided opportunities to design, develop, and create original artworks.

LESSON OBJECTIVE

Define the term ***nutrition.***
Identify nutrients, their sources, and their functions.

ASSESSMENT CRITERIA

- Name the major nutrients provided by food sources in each food group.
- Identify the major nutrients according to the functions they perform in the body.

ACTIVITIES & STRATEGIES

Discuss the definition of the term *nutrition* with the class. ***Nutrition*** is the foundation for good health and results in the effect of food on the body. The study of nutrition involves a study of the nutrients and how the body uses them.

Distribute and review the worksheet, "Nutrients and You," with the students. Instruct the students to fill in the blanks as you lead a discussion about the major nutrients provided by food sources in each food group.

The "Instructor's Resource Guide for Teaching Nutrition Education," found in the introductory section of *ESR IV*, provides the background information needed to lead the discussion on nutrients.

Display a poster size copy, or distribute the handout, "Appendix C: A Pattern for Daily Food Choices," to aid in the discussion.

After the discussion on all the food groups, review the answers with the class.

Health **High School**

HS

TEXAS EDUCATION AGENCY

RESOURCES & MATERIALS

Worksheet: "Nutrients and You"

Handout or poster: "Appendix C: A Pattern for Daily Food Choices"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

"Heart Challenges," American Heart Association Schoolsite Program, High School

ANSWER KEY

1. **Complex carbohydrates**
2. **Protein**
3. **Thiamin**
4. **Iron**
5. **Vitamin C**
6. **Vitamin A**
7. **Iron**
8. **Carbohydrates**
9. **Vitamin A**
10. **Vitamin C**
11. **Thiamin**
12. **Water**
13. **Calcium**
14. **Potassium**
15. **Protein**
16. **Iron**
17. **Niacin**
18. **Fat**
19. **Calcium**
20. **Phosphorus**
21. **Protein**
22. **Fat**
23. **Fat**
24. **Carbohydrates**

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

NAME ______________________ DATE ______________

Nutrients and You

FOOD GROUPS	NUTRIENTS	FUNCTIONS
Breads, Cereals, Rice, and Pasta	1. ____________	1. Provides energy
	2. ____________	2. Aids growth of new tissue and repair of body cells; promotes growth
	3. ____________	3. Helps release energy; promotes healthy nervous system
	4. ____________	4. Prevents some types of anemia; helps cells use oxygen; helps form red blood cells
Fruits	5. ____________	5. Helps hold body cells together; helps wounds heal; helps teeth and bones develop
	6. ____________	6. Promotes good eyesight; helps keep skin healthy; promotes growth
	7. ____________	7. Prevents some types of anemia; helps cells use oxygen; helps form red blood cells
	8. ____________	8. Provides energy; helps body use protein and fat
Vegetables	9. ____________	9. Promotes good eyesight; helps keep skin healthy; promotes growth
	10. ____________	10. Helps hold body cells together; helps wounds heal; helps teeth and bones develop
	11. ____________	11. Helps release energy; promotes healthy nervous system
	12. ____________	12. Helps in the formation of normal blood cells
	13. ____________	13. Builds strong bones and teeth; helps clot blood
	14. ____________	14. Assists in muscle contraction; maintains fluid and electrolyte balance; aids nerve impulses
Meat, Poultry, Fish, Dry Beans and Peas, Eggs, Nuts, and Seeds	15. ____________	15. Aids growth of new tissue and repair of body cells; promotes growth; provides energy
	16. ____________	16. Prevents some types of anemia; helps cells use oxygen; helps form red blood cells
	17. ____________	17. Helps produce energy; promotes healthy nervous system; makes cells work properly
	18. ____________	18. Provides energy and calories; carries fat-soluble vitamins
Milk Yogurt Cheese	19. ____________	19. Builds strong bones and teeth; helps clot blood
	20. ____________	20. Helps calcium build strong bones and teeth; aids cells in producing energy
	21. ____________	21. Aids growth of new tissue and repair of body cells, promotes growth
	22. ____________	22. Provides energy and calories; carries fat-soluble vitamins
Fats Sweets	23. ____________	23. Provide energy and calories; carries fat-soluble vitamins
	24. ____________	24. Provides energy only

Complete the blanks by naming the nutrients that perform the stated functions.
Use facts supplied by your teacher, or found in current nutrition references.

LESSON OBJECTIVE

Compare the nutritive value of foods.

ASSESSMENT CRITERIA

Describe the importance of selecting whole-grain breads and cereals.

ACTIVITIES & STRATEGIES

Before class, write this definition of grains on the chalkboard. ***Grains***: the edible seeds of certain plants, especially cereal plants such as wheat, rice, corn, and rye.

Distribute the worksheet, "Whole-grain or Refined?" Instruct the students to read "The Beginning of White Bread" from the worksheet.

After the students have completed the reading assignment on the worksheet, present this information about grains:
- The grains used by our ancestors from Europe were wheat, oats, and rye.
- Corn was the grain used by the Native Americans in the new settlements. Foods introduced by the Native Americans were corn pone, hoecakes, hominy, and succotash.
- Rice, the grain of the Orient, became common in 1694, when a ship laden with rice was blown off course from Madagascar. It landed at Charleston, South Carolina.

Discuss the students' favorite grains in breads and cereals.

Assign a student to check for information on the disease, ***beriberi***. If possible show pictures of the effects of the disease. Symptoms of beriberi include:
- mental confusion
- numbness in ankles and legs
- severe leg cramps
- paralysis
- cardiac failure

Instruct students to complete the worksheet, "Whole-grain or Refined?"

Provide samples of white bread, wheat bread, and whole wheat bread for the students to taste. Display the labels from each of the breads, and compare the three types of bread in relation to:
- flavor
- texture
- nutritive value
- fiber content
- cost

Review the answers to the worksheet with the class.

RESOURCES & MATERIALS

Worksheet: "Whole-grain or Refined?"

"Appendix E: Food Composition Table"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

"Changing the Course: Secondary Curriculum," American Cancer Society

Health textbook
Samples of white bread, wheat bread, and whole wheat bread
Labels from the bread packages

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

NAME ______________________________ DATE ________________

Whole - grain or Refined?

The Beginning of White Bread

Bakeries had been established in colonial America by 1640, and as the population expanded, many new settlers became bakers. Only whole-grain products were baked because white flour was too expensive, as it had to be milled by hand. Mechanical milling methods in the late 1800s brought down the price of white flour, and by 1900, white bread was common. By 1942, breads and cereals were required to be enriched because of the loss of nutrients through mechanical processing,

In the 1840s, iron rollers were used to process grain in Hungary. The old mills had pulverized the oily part, called the germ, as well as the larger part, called the endosperm. New iron rollers and later, porcelain rollers, popped the endosperm out of its coating or *bran*. The new method discarded the germ which contains fat; therefore, the flour could be stored for months or years without deteriorating. This method was unfortunate because, with the bran and germ removed, most of the nutrients were also removed. The mainstay of the diet of the industrial poor at that time was white bread, which caused a destructive effect on the health of these people. Beriberi, a disease caused by a deficiency of vitamin B_1, was first observed in the Far East, when the custom of polishing rice (removal of the germ from the rice) became widespread. Beriberi caused numbness in ankles and legs which was followed by severe cramping and paralysis. Heart disturbances led to death in many of these cases.

A Japanese physician and a Dutch scientist experimented to find the cause of beriberi. A number of years later, the Dutch scientist proved that thiamin deficiency caused beriberi. Further information about beriberi can be found in nutrition textbooks and encyclopedias.

I. Compare white bread, wheat bread, and whole wheat bread by filling in the chart below, using "Appendix E: Food Composition Table"

	Cal	CHO	Fat (g)	PUFA	SFA	A,(RE)	C	B_1 mg	B_2 mg	Nia	Ca	Fe	Na
White bread													
Wheat bread													
Whole wheat bread													

2. Explain the difference between wheat bread and whole wheat bread.

3. What is the first ingredient listed on each of the labels from these bread packages?

4. How many grams of fat are in one serving of each of the breads?

LEGEND

Cal	calories
CHO	carbohydrate
Fat	total fat
PUFA	polyunsaturated fatty acids
SFA	saturated fatty acids
A,(RE)	vitamin A
C	vitamin C
B_1mg	thiamin
B_2mg	riboflavin
Nia	niacin
Ca	calcium
Fe	iron
Na	sodium

LESSON OBJECTIVE

Discuss the Dietary Guidelines for Americans.

ASSESSMENT CRITERIA

Analyze the Dietary Guidelines for Americans in relation to the students' individual diets.

ACTIVITIES & STRATEGIES

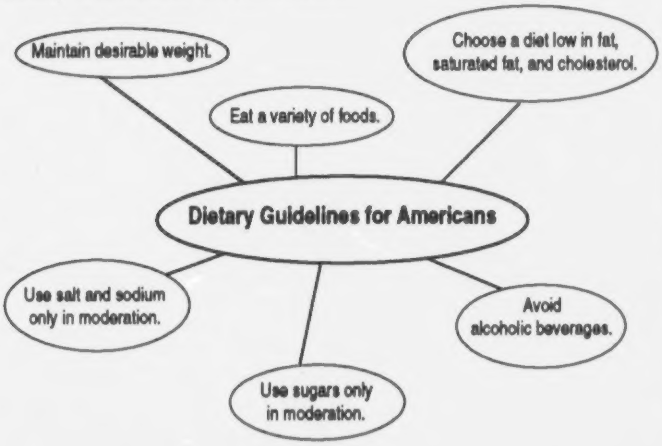
Divide students into small groups, then distribute and review the handout, "Appendix F: Dietary Guidelines for Americans" with the students.

Instruct each group to draw a mind map like the one shown in the diagram below:

- Write *Dietary Guidelines for Americans* in the center of the page, then circle it.
- Draw arrows from the center circle and write each guideline randomly around the center circle, then circle each guideline.

Tell each group to expand their mind map by brainstorming, then writing words or phrases relating to their diets that extend from each guideline. Remind them to include ideas for improving their diets in relation to each guideline.

After completion, ask a spokesperson from each group to write their mind map extensions onto an enlarged diagram on butcher paper. Discuss each group's ideas about the Dietary Guidelines for Americans.


Maintain desirable weight.
Choose a diet low in fat, saturated fat, and cholesterol.
Eat a variety of foods.
Dietary Guidelines for Americans
Use salt and sodium only in moderation.
Avoid alcoholic beverages.
Use sugars only in moderation.

RESOURCES & MATERIALS

Handout: "Appendix F: Dietary Guidelines for Americans"

"Heart Challenges," American Heart Association Schoolsite Program, High School

Butcher paper

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

Health **High School**

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Make wise food choices as part of self-responsibility for health and wellness.

ASSESSMENT CRITERIA

- Analyze the nutritive value of breakfast menus.
- Create different and nutritional breakfast menus.

ACTIVITIES & STRATEGIES

Present the following information to the class:

- It is recommended that breakfast should contribute to the individual's daily requirement of both calories and nutrients.
- This means that the breakfast should include one serving from each of these food groups:
  - Vegetables
  - Fruits
  - Breads, Cereals, Rice, and Pasta
  - Milk, Yogurt, and Cheese
  - Meat, Poultry, Fish, Dry beans and Peas, Eggs, Nuts, and Seeds
- The Meat group requires two to three servings per day. Most Americans include enough meat in the lunch and dinner meals, so a meat would not be required for breakfast.

Distribute the worksheet, "Breakfast Menus" and a copy of the handout, "Appendix C: A Pattern for Daily Food Choices."

Analyze each of the menus on the worksheet. Does each menu contain the correct number of servings from each food group? Answer the questions for each menu.

Divide the class into groups of four or five students.

Instruct each group to plan three breakfast menus and include the correct number of servings for each food group. Remind students that any food, whether it is a traditional breakfast food or not, is acceptable for breakfast. It simply depends on an individual's preferences.

RESOURCES & MATERIALS

Worksheet: "Breakfast Menus"

Handout: "Appendix C: A Pattern for Daily Food Choices"

School breakfast menu

"Heart Challenges," American Heart Association Schoolsite Program, High School

Nutrition education materials available from Associated Milk Producers, Inc., Consumer Services, Arlington, TX (817) 461-2674

Obtain a breakfast menu from the cafeteria manager.

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

NAME ______________________________ DATE ________________

Breakfast Menus

Analyze the following menus. Compare these with "Appendix C: A Pattern for Daily Food Choices." Write the food groups included in the blanks below each menu. Write any improvements needed in each menu.

Breakfast # 1
Baked Apple
Whole Wheat Toast - I slice
Milk- 2 cups

Food Groups included:

Improvement needed:

Breakfast # 2
Orange Juice - I cup
Bacon - I slice
Oatmeal with Milk - 3/4 cup; 1/4 cup milk
Butter and Sugar - 2 teaspoons each

Food Groups included:

Improvement needed:

Breakfast # 3
Grapefruit Halves - 1
Peanut Butter - 2 tablespoons
on
Whole Wheat Toast - I slice
Hot Chocolate - I cup

Food Groups included:

Improvement needed:

Today's School Breakfast Menu
(Fill in the breakfast menu from today's school menu.)

Food Groups included:

Improvement needed:

Plan three different breakfast menus that include the correct number of food groups. Each menu should contain different foods, for example, eggs and bacon could be used only once.

Breakfast 1	***Breakfast 2***	***Breakfast 3***

LESSON OBJECTIVE

Make wise food choices as part of self-responsibility for health and wellness.

ASSESSMENT CRITERIA

Recognize the importance of nutrition as it relates to physical fitness.

Health **High School**

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Define ***carbohydrate loading*** as a diet that is very high in complex carbohydrates, about 65-70 percent of total calories, for four or five days prior to an event lasting more than two hours. The latest research indicates that there are no significant benefits from carbohydrate loading. Too little carbohydrates in the diet could negatively affect performance, but adding carbohydrates above a certain level has no detectable effect on performance.

Define ***protein packing*** as overloading or eating too much protein food which is unhealthy because many of these foods may also contain high amounts of fats, particularly cholesterol. Overloading on protein can put the kidneys under stress due to large amounts of nitrogen that need to be excreted.

Ask students to list some nutritional practices of athletes that they believe will enhance performance. Ask a student to write each item on the chalkboard as it is listed.

Discuss the importance of:
- fluids and sport drinks
- sport supplements
- iron for women athletes
  - ° sports anemia
  - ° amenorrhea

Ask students to summarize the key points of the above discussion.

Extension:
Ask students to bring some labels of sport drinks and analyze the label ingredients.

RESOURCES & MATERIALS

The Tufts University Guide to Total Nutrition by Stanley Gershoff, Ph. D. with Catherine Whitney

"Heart Challenges," American Heart Association Schoolsite Program, High School

Body Culture (video) available from the Texas Beef Industry Council, 8310 Capitol of Texas Hwy, Suite 440, Austin, TX (512) 345-3531

Food Power: A Coaches Guide, available from the National Dairy Council, 6300 N. River Rd, Rosemont, IL 60018 (708) 696-1860

Eat To Compete (video)
Available from the NET Library at this address:
Nutrition Education and Training Program
Texas Department of Human Services
The Library 434-W
701 West 51st Street
Austin, TX 78769
(512) 450-3530

TEACHER TIP

A pre-competition meal should consist primarily of complex carbohydrates and should be eaten one to four hours before the activity.

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The students shall be provided opportunities to: understand responsible behavior and the interrelationships of diet, exercise, rest, and recreation.

LESSON OBJECTIVES

- Make wise food choices as part of self-responsibility for health and wellness.
- Explain the role of nutrition and physical fitness in maintaining good health.

ASSESSMENT CRITERIA

Develop a list of nutritional guidelines for athletes.

Health **High School**

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Identify eating disorders of athletes (wrestlers, gymnasts, drill team, cheerleaders, skaters, ballet dancers, jockeys):
- anorexia nervosa
- bulimia nervosa

List some reasons that athletes are concerned about body image and physique:
- self-concept
- competitiveness
- denial of physical discomfort/"no pain-no gain" myth
- pressures from society and from themselves

Excessive exercise is sometimes considered a type of "eating disorder." Some people who exercise compulsively feel that they are purging their bodies of unwanted fat.

Discuss Kathy Rigby and Mary Lou Retton. Both had eating disorders that resulted from their careers as gymnasts.

Summarize ways to recognize eating disorders in athletes.

Using textbooks and other available resources, ask students to develop a list of nutritional guidelines for athletes.

After completing their lists, ask students to give some of their guidelines to the class as you write them on the chalkboard.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

The Tufts University Guide to Total Nutrition by Stanley Gershoff, Ph.D. with Catherine Whitney

Health textbooks and other available resources

"Heart Challenges," American Heart Association Schoolsite Program, High School

"Food Power: A Coaches Guide," National Dairy Council

Nutrition Education and Training videos:
- *Fear of Fat: Dieting and Eating Disorders*
- *Anorexia Nervosa: The Covert Rebellion*
- *Portrait of an Anorexic*
- *Eating Disorders - The Slender Trap*

Available from the NET Library at this address:
Nutrition Education and Training Program
Texas Department of Human Services
The Library 434-W
701 West 51st Street
Austin, Texas 78769
(512) 450-3530

TEACHER TIP

Examine magazine photos of role model athletes to help students understand the media misconception of physical fitness.

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The students shall be provided opportunities to understand responsible behavior and the interrelationships of diet, exercise, rest, and recreation.

LESSON OBJECTIVE

Make wise food choices when eating away from home.

ASSESSMENT CRITERIA

Recognize the value of the School Breakfast Program.

ACTIVITIES & STRATEGIES

Discuss how breakfast patterns differ on the weekends.

School food service has provided hot, nutritious breakfasts and lunches to millions of students for more than 45 years. Since breakfast is important in the diet, many parents rely on the school food service program to provide breakfast to their children.

Students who do not eat breakfast may become irritable, restless, or lethargic. Breakfast allows students to:

- do more accurate work in the later morning hours
- control weight because there is less tendency to overeat later in the day
- decrease the number of accidents at school
- consume important nutrients and calories needed to perform well in school

Dietitians recommend that breakfast provide approximately one-third of an individual's daily requirement of both calories and nutrients. This means that breakfast should include at least one serving from the Milk-Cheese group, Fruit or Vegetable groups, and the Bread-Cereal group. A serving from the Meat-Poultry-Fish group is optional at breakfast since this requirement is usually met through lunch and/or dinner.

Divide the class into groups of five or six. Ask each group to make up a breakfast menu for the School Breakfast Program that follows government guidelines.

Ask students to check their menus to see that the Milk-Cheese, Fruit or Vegetable, and the Bread-Cereal groups are included in their breakfast menus. Ask some students to share their menus with the class.

RESOURCES & MATERIALS

"School Breakfast Pattern," supplement to "Appendix C"

"Heart Challenges," American Heart Association Schoolsite Program, High School

- **In advance, check with the cafeteria manager about the possibility of providing a taste test of breakfast foods.**
- **In advance, ask the cafeteria manager to comment on the menus developed by students and explain the National School Breakfast Pattern.**

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

LESSON OBJECTIVE

Make wise food choices when eating away from home.

ASSESSMENT CRITERIA

Identify ways to improve food selections when eating away from home.

ACTIVITIES & STRATEGIES

Lead students in brainstorming to identify places one can eat other than at home. Possibilities include:
- snack bar
- vending machines
- fast-food drive-ins
- restaurants
- places in the mall
- cafeterias
- social functions

Divide students into small groups to study menus available from the list above. Tell each group to answer the following questions:
- What types of food and methods of preparation are available at each place?
- How do the food types and methods of preparation influence nutritive values? (Certain foods may be higher in fats, sugars, and salt.)
- What food selections can provide a nutritionally balanced meal?
- Which foods should be avoided? Why?

Instruct each group to prepare a list of suggestions for eating away from home. Utilize and add to the list found in the opposite column.

After the groups have completed the discussion questions and the suggestion lists, ask the class to share their answers and lists.

Extension:
Ask students to survey foods available in school vending machines to determine the most nutritious selections and suggest more nutritious alternatives. Tell the students to write a letter to the school administration recommending that more nutritious food selections be offered in the school vending machines.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Menus from several eating establishments

Guidelines for eating out:
- Select foods which provide nutrients without calorie overload.
- Select a la carte foods when possible.
- Avoid salad dressings, empty-calorie foods, sauces, and fried foods.
- Patronize health-conscious restaurants.
- Vary the type of restaurants and the type of foods eaten.
- Take small portions when you serve yourself.

TEACHER TIPS

- **For more information, refer to *ESR IV*, Appendix C and Appendix F.**
- **Videotape commercials about eating establishments and discuss their messages.**

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

LESSON OBJECTIVE

Analyze personal food habits.

ASSESSMENT CRITERIA

Describe the ways that a student's lifestyle influences his or her choice of foods.

Health **High School**

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Write the definition of *lifestyle* on the chalkboard and discuss the definition with the class.

Ask students to give examples of different lifestyles.

Divide the class into small groups. Ask each group to select a spokesperson who will record notes to report to the class. Distribute the worksheet, "Lifestyles and Food Choices." Review and discuss the questions on the Group Activity section of the worksheet.

Instruct each group to draw some conclusions about the lifestyles and eating habits of each of the students in that group. How are they similar and different? Ask each spokesperson to report their group's conclusions.

Ask the students to complete the Individual Activity section of the worksheet. The students should analyze their eating patterns by comparing them to the handout, "Appendix F: Dietary Guidelines for Americans."

RESOURCES & MATERIALS

Worksheet: "Lifestyles and Food Choices"

Handout: "Appendix F: Dietary Guidelines for Americans"

"Heart Challenges," American Heart Association Schoolsite Program, High School

Dictionary

TEACHER TIP

Suggestions for discussion in the Group Activity on the worksheet:

7.
- **People in Spain eat five meals a day.**
- **Germans may eat as many as five meals a day.**
- **People in Mexico with ample incomes eat four meals a day.**
- **The British have four meals each day which includes a small meal in the afternoon, called *tea*.**

8. **Consider the effects of the new McDonald's in Moscow on the agricultural and eating habits of the people in that city.**

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to relate personal behavior to wellness.

NAME ________________________________ DATE ____________________

Lifestyles and Food Choices

Group Activity

Answer these questions in groups. Elect a spokesperson to take notes and report to the class.

1. Give three reasons that families do not cook meals at home as they did in your grandmother's day.
2. Explain why family members do not eat meals together.
3. List the types of eating establishments you go to most often.
4. How many meals do you eat in one day? Do you often skip a meal? If so, which meal do you skip?
5. How many times a day do you eat a snack? What types of snacks do you eat?
6. How do your eating patterns compare with your parents' eating patterns when they were your age? How do they compare with your grandparents' eating patterns when they were your age?
7. Do families in other countries eat three meals a day? Explain the difference between eating patterns in the U.S.A. and in other countries.
8. Discuss eating habits, food choices, and agricultural trends in three of the countries you have studied.

Individual Activity

On a separate sheet of paper, answer these questions about your personal eating habits during the past week.

1. Do you usually eat breakfast? If not, why not?
2. Do you usually eat one meal a day with your family? Do family work schedules prevent this?
3. Do you prepare meals for yourself and/or help prepare meals for the family?
4. Does your family often use convenience foods such as boxed macaroni and cheese, tuna helper, or cake mixes? Give examples of the types of convenience foods used in your home.
5. Does your family often eat meals away from home? If so, where are your favorite places to eat?
6. Do you eat snacks daily? List the types of snacks you usually eat.
7. How many soft drinks do you drink daily?
8. Compare your eating habits with "Appendix F: Dietary Guidelines for Americans."
9. Select two food habits which you will try to improve during the next week.
10. Keep a daily diary evaluating your progress.

LESSON OBJECTIVE

Determine the effects of peer pressure on food choices.

ASSESSMENT CRITERIA

Assess influences on students' choices regarding where and what to eat at the noon meal.

ACTIVITIES & STRATEGIES

Discuss the factors that affect students' choices regarding their noon meal.

- What do they eat?
- Where do they eat?
- Why?

Also tell them to compare factors related to selections, such as nutritive values of foods, costs, time, and lunch companions. Refer to "Appendix E: Food Composition Table."

Select several students to participate in a panel discussion entitled, "The Bunch Goes to Lunch."

Instruct the class to ask questions of the panel members about:

- eating in the school cafeteria
- eating a school lunch versus snack bar foods
- packing a lunch
- eating at a local restaurant
- vending machines

Based on points discussed by the panel, work with the class to develop a score card for their noon meals and their locations.

Instruct students to use the score card they developed to rate noon meals for three days.

On the fourth day, discuss the ratings of the students' noon meals and the locations of these meals.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*. See the section on "Food Choices and Peer Pressure."

"Appendix E: Food Composition Table"

Nutrition information available from local food establishments

Share with your cafeteria manager some reasons that students choose to eat away from school.

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

LESSON OBJECTIVE

Examine eating patterns from the past and predict the future.

ASSESSMENT CRITERIA

Analyze the differences between meal patterns.

ACTIVITIES & STRATEGIES

Present the following information to the students: Exploration, inventions of machinery, commerce, and exchange of ideas have developed because of our need and desire for appetizing foods.

Below are two different meal patterns: one for a 1942 farm family and one for a 1992 wage earner's family. Tell students to study the two meal patterns and then assign the students to complete the worksheet, "Eating Patterns: Past-Present-Future."

MEAL PATTERN FOR A 1942 FARM FAMILY

6:00 am—Breakfast
- Oatmeal
- Butter, sugar, and milk
- Sausage (2 for husband)
- Fried eggs (2 for husband)
- Biscuits and butter
- Grape jelly
- Milk

8:00 pm—Supper
- Fried pork chops
- Gravy
- Mashed potatoes
- Buttered English peas
- Cornbread and butter
- Egg custard
- Milk

12:00 Noon—Lunch
- Fried chicken (2-3 pieces)
- Gravy
- Mashed potatoes
- Macaroni and cheese
- Green beans
- Onions and cucumbers
- Hot rolls and butter
- Peach cobbler
- Homemade ice cream
- Lemonade

4:00 pm—Snack
(taken to the field)
- Bologna sandwiches (2) with lettuce and tomato slices
- Iced tea

MEAL PATTERN FOR A 1992 WAGE EARNER

7:00 am —Breakfast
- Ready-to-eat cereal
- Milk

12:00 Noon — Lunch
- Hamburger
- Potato chips
- Cola

10:00 am—Coffee break
- Doughnut
- Coffee

6:00 pm—Dinner
- Broiled steak
- Baked potato with butter and sour cream
- Salad with dressing
- Iced tea
- Bread

RESOURCES & MATERIALS

Worksheet: "Eating Patterns: Past-Present-Future"

Handout: "Appendix C: A Pattern for Daily Food Choices"

Extension:
Instruct students to evaluate meals for fat content and sodium content.

TEACHER TIP

Emphasize that nutrition plays a major role in disease prevention and lifespan, but there are other factors that affect lifespan (exercise, medical care, new medicines).

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to understand responsible behavior and the interrelationship of diet, exercise, rest, and recreation.

NAME ______________________________ DATE ______________

Eating Patterns:

Past—Present—Future

Compare the meal patterns provided for 1942 and 1992 with "Appendix C: A Pattern for Daily Food Choices." Write the food eaten from each food group in the columns below; then on your own paper, answer the questions at the bottom of the page.

Daily Food Choice Groups	1942 Farmer's Daily Meal Pattern	1992 Wage Earner's Daily Meal Pattern
Vegetables		
Fruits		
Bread, Cereals, Rice, and Pasta		
Milk, Yogurt, and Cheese		
Meat, Poultry, Fish, Dry beans and Peas, Eggs, Nuts, and Seeds		
Other		

1. List the food groups and number of servings missing from each day's menus. List suggested improvements for each daily meal pattern.
2. Analyze the need for differences in the size of the two meal patterns. Explain your ideas in several paragraphs.
3. Predict the difference in the amount of exercise between the two families' lifestyles. What suggestions would you make for the wage earner?
4. Predict the number of hours of sleep that the farmer received; the wage earner received.
5. Explain your predictions for meal patterns 50 years from now, considering the jobs and lifestyles, the availability of convenience and space-age foods, and the knowledge of nutrition in relation to disease prevention and the individual's wellness.

LESSON OBJECTIVE

Describe nutritional needs throughout the life cycle.

ASSESSMENT CRITERIA

Analyze basic nutritional needs of adolescents.

ACTIVITIES & STRATEGIES

Divide the class into small groups and distribute the handout, "How Teenagers View Nutrition." Assign each group to read and study one of the case studies in the handout. Distribute the handouts, "Appendix C: A Pattern for Daily Food Choices" and "Appendix F: Dietary Guidelines for Americans" for students to use as references.

Ask students to evaluate the strengths and weaknesses of the case study assigned to them.

Students should respond to the following questions:
- What conclusions can you draw about the attitudes of the person in the case study toward nutrition? Give evidence to support your answer.
- How are eating habits reflective of a person's behavior?
- Why do people have an obligation to themselves to eat nutritionally balanced diets?

After the groups have evaluated the case studies, ask a spokesperson from each group to share their findings with the class.

RESOURCES & MATERIALS

Handout: "How Teenagers View Nutrition"

Handout: "Appendix C: A Pattern for Daily Food Choices"

Handout: "Appendix F: Dietary Guidelines for Americans"

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

HOW TEENAGERS VIEW NUTRITION

Case Study #1
When Joe was a child, his parents were strict vegetarians. They served many vegetables and soy protein products to him which he did not like very much. He used to complain to them that he wanted to eat the foods his friends ate, like hamburgers and pepperoni pizza. Finally, when he was about ten years old, they decided to change the family's diet and give him freedom to choose what he wanted to eat at meals. Due to the things his parents used to say about nutrition, Joe still thinks nutrition means being forced to eat a food he does not like just because somebody says it is good for you. He refuses to eat most vegetables, hates anything with soy protein in it, and avoids any food which is advertised as nutritious, such as vitamin-enriched cereals.

Case Study #2
Lupe eats many fried foods. Everyday, she has two doughnuts for breakfast, potato chips for a snack at midmorning, french fries with a hamburger or fried chicken nuggets for lunch, and an evening meal which often consists of fried fish, meat, or poultry, and deep fried vegetables. Lupe is active in several sports activities at school and is at her "ideal weight," according to the weight charts for teenagers. Her doctor suggested she stop eating fried foods, but she does not think her eating habits are so bad. She feels healthy, so she has decided to continue eating the kinds of foods she likes best—fried foods.

Case Study #3
Chi Yin is the best tennis player in his region of the state. He plays on the high school tennis team and wins most amateur tournaments he enters. Being a good player requires much practice time, and with school and his part-time job, he usually cannot get home for regular meals. In fact, food does not matter to him much, and he frequently eats the same things for lunch and supper everyday. He usually orders something quick at a fast-food restaurant at noon and after practice on his way to his evening job. His parents are concerned about his eating habits, but Chi does not think nutrition is very important, just as long as he is not hungry when he is practicing.

Case Study # 4
Diana has been wanting to lose 30 pounds for a long time now, so she is eager to try any new weight loss diet she hears about. Her mother usually joins her in the diet and they shop for the foods and prepare them together. They often get tired of the diet after a couple of weeks. The last diet that they went on was one that Diana's best friend had read about in a magazine. It consisted of one week of eating only fruit, a second week of eating only lean meat, followed by three days of fasting. They gave up the diet after only three days. Diana and her mother do not know much about nutrition, so they are not very good at making decisions about whether a diet is healthy for them. The next weight loss diet they plan to try is called the Eat Thin, Be Thin diet. Three of Diana's friends are on the diet, and they all say they have lost several pounds in the first week of the diet.

LESSON OBJECTIVE

Describe nutritional needs throughout the life cycle.

ASSESSMENT CRITERIA

Analyze basic nutritional needs of adolescents.

ACTIVITIES & STRATEGIES

Distribute and review the handout, "Appendix D: Recommended Dietary Allowances," with the students.

Investigate the differences in recommended amounts of nutrients for males and females in the same age groups.

Emphasize that the adolescent growth spurt occurs for females between the ages of 10-15 and for males between the ages of 12-19.

The growth nutrients, including proteins, folate, calcium, phosphorous, and iron are needed in increased quantities during adolescence. The need for added iron is caused by the onset of menstruation in females and by the lean body mass in males.

Discuss the reasons that teenage females are more likely to have nutrient-deficient diets than teenage males. Stress the overemphasis of thinness for females by magazine models, beauty pageants, and adult female role models. Discuss the pressures on males to gain or lose weight for athletics.

Lead a class discussion using the following questions:
- Are the pressures the same for males as well as females?
- Is there a "double standard" attitude from society applied to overweight females versus overweight males?

Distribute the worksheet, "RDA for Teenagers." Instruct students to use the handout, "Appendix D: Recommended Dietary Allowances," to answer the questions on the worksheet. After completion, ask some students to share their answers with the class.

RESOURCES & MATERIALS

Worksheet: "RDA for Teenagers"

Handout: "Appendix D: Recommended Daily Allowances"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

"Heart Challenges," American Heart Association Schoolsite Program, High School

ANSWER KEY

1. **Answers will vary**
2. **1200 mg; needs are the same**
3. **Females need more because they lose blood and iron through menstruation.**
4. **Water-soluble vitamins are easily dissolved by water and not stored in the body. Fat-soluble vitamins are not dissolved by water, but are stored in body fat.**
5. **Protein, Vitamins D, K, C, Folate, B-12, calcium, phosphorous, and iodine**
6. **Zinc and iodine**
7. **For rapid growth spurts and to build strong bones and muscles**
8. **Fortified bread, fortified milk; body synthesizes Vitamin D from sunlight.**

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety: The student shall be provided opportunity to develop patterns of food selection that contribute to wellness.

NAME ______________________________ **DATE** ________________

RDA FOR TEENAGERS

Instructions: Using the RDA chart, answer the following questions. Be sure to identify your answer in milligrams as necessary.

1. What amount of vitamins A and C would you need for your age and sex?

2. How much calcium does a 15-year-old teenager need?

3. Do females need more or less iron than males after age 18? Why?

4. How do fat-soluble vitamins and water-soluble vitamins differ?

5. Which nutrients have similar recommendations for both females and males?

6. Which minerals remain the same in required amounts from age eleven throughout the lifetime of males?

7. Why are high amounts of vitamin D required during infancy, childhood, and teenage years?

8. What are our best sources of vitamin D?

114

LESSON OBJECTIVE

Discuss ways to achieve a low-fat diet.

ASSESSMENT CRITERIA

Modify eating practices which include high risk factors for heart disease.

ACTIVITIES & STRATEGIES

Discuss the following information about fat as a major contributor to heart disease.

The risk factors of heart disease.

- high blood cholesterol
- high blood pressure
- smoking
- heredity (includes race)*
- increasing age*
- stress
- physical inactivity
- obesity

*cannot be changed

Identify complications of a high-fat diet:

- elevated blood cholesterol levels
- atherosclerosis
- obesity

Identify the types of fat:

- Saturated
  - found in animal products
  - solid at room temperature
  - associated with cardiovascular disease
  - associated with cholesterol
- Unsaturated
  - derived from plant products
  - liquid at room temperature
  - should comprise most of the fat calories in one's diet

Fat has many functions in the body. It provides insulation and padding for organs, nourishes the hair and skin, and aids in energy metabolism. However, an excessive amount of fat in the diet is a risk factor for heart disease.

Invite a heart by-pass or transplant patient to speak about the changes in lifestyle necessitated by heart disease such as diet, exercise, and stress management.

Discuss preventive lifestyle changes that students can make now.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*. See the sections on "Fats" and "Lowering Blood Cholesterol Levels."

"Heart Challenges," American Heart Association Schoolsite Program, High School. See Lesson #4, "The Mystery of Cholesterol" from the Take Charge module.

TEACHER TIPS

- **Remind students that the single most effective step that they can take to reduce calories is to trim and reduce fat in the diet.**
- **Remind students that coconut oil and palm oil, although they are plant products, are very high in saturated fat.**

In advance, arrange for the cafeteria manager to discuss ways that food service modifies fat in the school meals.

ESSENTIAL ELEMENT

Health. Health-related concepts and skills that affect the well-being of people collectively. The student shall be provided opportunities to investigate current health issues.

LESSON OBJECTIVE

Explain the relationship of high intakes of sodium to hypertension.

ASSESSMENT CRITERIA

- Identify foods high in sodium.
- Explain the role of sodium in the human body.
- Examine the health hazards associated with excess sodium intake.

ACTIVITIES & STRATEGIES

Bring sample food labels, or ask students to bring labels of the foods listed on the worksheet, "What's On the Label?"

Lead a class discussion about sodium that includes the following information:

- Sodium functions in the body as an electrolyte. Electrolytes affect the way fluid is distributed in the body and aid the nervous system in transmitting nerve impulses that control muscle action. This helps keep the heart beating normally.
- Excessive consumption of sodium may result in ***hypertension***, or high blood pressure.
- High blood pressure may be hereditary, a result of obesity, or a result of too much salt in the diet.
- Due to the increased incidence of hypertension in adults, health professionals recommend that persons without health problems limit their sodium intake to 2400 milligrams per day. A teaspoon of salt contains 2100 milligrams of sodium.
- One method of reducing salt in the diet is to flavor foods with herbs and spices instead of salt.

Additional information on sodium can be found in the "Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*.

Divide the class into small groups and instruct each group to us the sample food labels to complete the worksheet, "What's On the Label?"

After completion, ask the groups to list the hidden sodium content of each food item. Ask students to discuss suggestions for reducing sodium in the diet.

RESOURCES & MATERIALS

Worksheet: "What's On The Label?"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

"Heart Challenges," American Heart Association Schoolsite Program, High School, Take Charge module

Food labels

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

NAME ______________________________ DATE ________________

What's on the Label?

Directions:
Foods which contain no table salt and do not taste salty may have a high amount of hidden sodium. Analyze the labels on the following foods and list ingredients which indicate a high sodium content. Look for the words "soda" or "sodium," or the symbol "Na" on the label.

FOOD **HIDDEN SODIUM**

1. Canned tuna ______________________________
2. Instant pudding and pie filling ______________________________
3. Canned soup ______________________________
4. Baking powder ______________________________
5. Bouillon cubes ______________________________
6. Italian salad dressing ______________________________
7. Cottage cheese ______________________________
8. Sauerkraut ______________________________
9. TV dinner ______________________________
10. Frankfurters ______________________________
11. Processed American cheese ______________________________
12. Catsup ______________________________
13. Baking soda ______________________________
14. Corned beef ______________________________

LESSON OBJECTIVE

List strategies for reducing the amount of sugar in the diet.

ASSESSMENT CRITERIA

- Identify different terms for sugar.
- Describe ways to reduce sugar in the diet.

ACTIVITIES & STRATEGIES

Discuss the following: The average American consumes approximately sixty to eighty pounds of sugar a year which is about one-fourth pound of sugar per day. One reason for this high-sugar intake may be the amount of hidden sugar found in convenience food items. High-sugar foods have often been linked to health problems such as obesity, heart disease, and tooth decay.

One way to increase your awareness of the many different sources of sugar in your diet is to read ingredient labels on the product you are buying or using.

List and discuss the following sugar terms used on food labels:
Sucrose—white refined table sugar, brown sugar, confectioners' sugar
Fructose—the most concentrated sweetener; found in fruits
Maltose—malt sugar; found in breads and cereals
Lactose—milk sugar; found in milk and milk products
Glucose—honey, corn syrup

Other words for sugars used on food labels include:

- brown sugar
- confectioners' sugar
- corn sweeteners
- syrup
- dextrose
- granulated sugar
- honey
- high-frutose corn sweeteners
- maple sugar
- molasses
- natural sweetener
- raw sugar
- invert sugar (glucose and fructose)

If any of these sugars are listed at the beginning of the list of ingredients on a product, then the product has a high sugar content.

Discuss ways to reduce the amount of sugar in the diet (refer to the information in the opposite column).

Distribute the worksheet, "How Sweet It Is!" and tell the students to circle the forms of sugar that are present on the food labels. After completion, review the sugars given on each food label with the class.

RESOURCES & MATERIALS

Worksheet: "How Sweet It Is!"

"Heart Challenges," American Heart Association Schoolsite Program, High School

Teacher information:
Strategies for reducing the amount of sugar in the diet include:

- Select pure fruit juices rather than soft drinks or imitation fruit drinks.
- Choose unsweetened cereals rather than the presweetened varieties. Learn to read the labels for sugar content; some cereals are 50-60% sugar.
- Eat fruits canned in natural juices rather than in heavy syrups.
- Reduce intake of "empty-calorie" foods which contain calories, but no nutritional value.
- Select fresh fruits for snacks. The sugar content of dried fruits is much higher by weight because the water has been removed.
- Try using the sweet spices (allspice, cardamon, cinnamon, cloves, coriander, ginger, and nutmeg) to replace some of the sugar in recipes.

ANSWER KEY

1. brown sugar, corn syrup, honey, sugar
2. natural sweeteners
3. corn syrup, sugar
4. sugar, corn syrup solids
5. sugar, syrup

In advance, invite the cafeteria manager to discuss changes that have been made to reduce sugar in the school menus.

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to relate personal behavior to wellness.

NAME ______________________________ DATE ______________

HOW SWEET IT IS !

Read each label below, and circle the form or forms of sugar in each product.

GRANOLA (OATS, COCONUT, BROWN SUGAR), VEGETABLE SHORTENING, CORN SYRUP, HONEY, CHOCOLATE CHIPS (SUGAR, CHOCOLATE LIQUOR, COCOA BUTTER, SOY LECITHIN), SUGAR, NON-FAT MILK, CRISP RICE (RICE FLOUR, WHEY, SUGAR, MALT, SALT), COCOA, SOY LECITHIN, SALT, CARRAGEENAN (A VEGETABLE GUM), VEGETABLE EMULSIFIERS (MONO AND DIGLYCERIDES), VANILLIN AN ARTIFICIAL FLAVOR

CHEWY CHOCOLATE CHIP GRANOLA BAR

①

② **CATSUP**

TOMATOES, NATURAL SWEETENERS, WATER, DISTILLED VINEGAR, SALT, ONION POWDER, AND NATURAL FLAVORS

BLEACHED AND ENRICHED WHEAT FLOUR CONTAINING NIACIN, REDUCED IRON, THIAMIN MONONITRATE (VITAMIN B_1) AND RIBOFLAVIN (VITAMIN B_2), CORN SYRUP, VEGETABLE SHORTENING PARTIALLY HYDROGENATED SOYBEAN AND OR/ COTTON SEED OIL) OATMEAL, RAISIN, SUGAR, MODIFIED FOOD STARCH, SALT, SODIUM BICARBONATE, SOY LECITHIN, CINNAMON, ARTIFICIAL COLOR

Oatmeal Raisin Cookies

③

HOT COCOA MIX

④

SUGAR, SWEET DAIRY WHEY, CORN SYRUP SOLIDS, DUTCH-PROCESS COCOA, PARTIALLY HYDROGENATED VEGETABLE OIL (MAY CONTAIN ONE OR MORE OF THE FOLLOWING OILS: COCONUT, COTTON SEED, PALM, PALM KERNEL, SAFFFLOWER, OR SOYBEAN) NONFAT DRY MILK, CELLULOSE GUM (FIBER), SALT, SODIUM CASEINATE (PROTEIN), ARTIFICIAL VANILLA FLAVOR

sugar, syrup, water, cellulose gum, natural and artificial flavors, salt, sodium hexametaphosphate, sorbic acid and sodium benzoate (preservatives), caramel color

REDUCED CALORIE SYRUP

⑤

Health **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Describe the relationship between nutrition and the prevention and treatment of health problems (cancer, common cold, diabetes, heart disease, PKU).

ASSESSMENT CRITERIA

Analyze a diet and determine some improvements for cancer prevention.

ACTIVITIES & STRATEGIES

Discuss the following words in relation to cancer. Assign students or groups of students to define and research the terms that the class knows the least about. All the terms may be researched.

- vitamin A, retinol
- vitamin C, ascorbic acid
- carotene-rich vegetables
- cruciferous vegetables
- total energy intake
- lacto-ovo-vegetarian diet
- food additives
- contaminants of food
- carcinogen
- smoking or chewing tobacco
- protein
- lipid
- carbohydrates
- nitrates
- nitrite
- nitrosamines
- fiber
- genes
- initiating agent

Discuss the new information about these terms, then ask students to analyze their individual diets and habits and evaluate them in relation to cancer prevention.

Instruct students to write a summary, with an introductory paragraph, an analysis of their diet, improvements needed to help prevent cancer, and reasons why these improvements are needed.

Ask some students to share their summaries with the class.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

"Changing the Course: Secondary Curriculum," American Cancer Society

Library books
Textbooks

TEACHER TIP

This lesson could extend over two days or be assigned as homework, depending on the availability of the reference books.

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

LESSON OBJECTIVE

Describe the relationship between nutrition and the prevention and treatment of health problems (cancer, common cold, diabetes, heart disease, PKU).

ASSESSMENT CRITERIA

Recognize the relationship between nutrition and diabetes.

Health High School
HS
TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Discuss the following information about diabetes:
Diabetes is a metabolic disorder in which the body does not use or cannot produce insulin properly. This results in the body's inability to use glucose properly.

Diabetes is not a single disease, but rather a group of disorders. The two major types are:

- Type I—insulin dependent
  - often called juvenile-onset diabetes
  - twelve is the mean age of onset
  - onset is sudden
- Type II—non-insulin dependent
  - develops later in life
  - associated with obesity
  - cells become insensitive to insulin
  - accounts for 95% of total diabetic population
  - onset is gradual

Use a human anatomy chart or model to locate the islets of Langerhans in the pancreas.

- What is the role of insulin and its effect on the body?
  - Insulin is a hormone secreted by the islets of Langerhans in the pancreas. Insulin allows the body to use and store glucose.
- What happens if these endocrine cells do not function properly?
  - When the supply of insulin is inadequate, glucose that is not metabolized accumulates in the blood and is excreted in the urine.
  - Excessive urine and excessive thirst are symptoms of diabetes.

Display the transparency, "Diabetic Dietary Guidelines," and ask students to design informative posters about diabetes on 12" x 18" sheets of white or colored construction paper. Some suggested topics might include:

- the effects of diabetes on eating habits
- the importance of weight control for the diabetic
- diabetes and exercise
- how diabetes is treated
- the different types of diabetes

Ask students to describe their completed posters to the class.

RESOURCES & MATERIALS

Transparency: "Diabetic Dietary Guidelines"

The Tufts University Guide to Total Nutrition by Stanley Gershoff, Ph.D. with Catherine Whitney, 1990

Encyclopedias
Textbooks
Library resources

TEACHER TIPS

- **Insulin shock is characterized by the following: weakness, hunger, dizziness, headache, and fainting. The person needs immediate sugar in the form of candy, fruit juice, or other sweetened liquid. Without sugar, the person may go into convulsions or a coma.**
- **Invite someone with diabetes to talk with the class about their experiences with the disease.**

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual health and safety. The student shall be provided opportunities to relate personal behavior to wellness.

Diabetic Dietary Guidelines

- A diet high in complex carbohydrates such as vegetables, fruits, and whole-grain breads and cereals is advisable.
- Increase intake of water-soluble fibers such as oats, barley, bran, lentils, and beans. Other fiber-rich foods include fruits, vegetables, cereals, nuts, and seeds. Studies indicate high-fiber diets tend to lower levels of blood sugar, thus lowering the need for insulin.
- Reduce consumption of high-fat foods by limiting daily fat intake to no more than 30 percent of total calories. Selecting lean cuts of meat, trimming fat before cooking, and removing the skin from chicken and turkey are ways to reduce fat.
- Decrease intake of foods high in sodium. Restrict consumption of candies and foods made with processed sugars.
- A regular exercise program is important because it lowers blood sugar and helps to control weight gain.
- It is important to establish a regular feeding schedule to maintain appropriate blood sugar balance.
- It is essential that the diabetic patients follow the prescribed diet.
- There is no one proper "diabetic diet." Dietary requirements are based upon the individual's health needs, the severity of the disease, the type and dosage of insulin used, and the physical fitness and weight of the individual.

LESSON OBJECTIVE

Determine the relationship between nutrition and weight control.

ASSESSMENT CRITERIA

Compare the number of calories burned by performing different activities.

ACTIVITIES & STRATEGIES

Set up a table in the front of the room with a selection of favorite snack foods such as candy, chips, and soft drinks.

Explain that a *calorie* is a unit of energy measure used to state the energy content of food.

Work with students to determine the caloric content of the displayed snacks. Refer to "Appendix E: Food Composition Table" to determine caloric content or the nutrition information on the food label.

Tell the students to use the handout, "Spending Calories" to determine how long it would take to perform the listed activities to utilize calories consumed from specific snacks. This may vary with individual metabolic rates. More exercise increases muscle size which raises the metabolic rate for burning calories.

Note the caloric density of nutrients:
- fats = 9 calories per gram
- carbohydrates = 4 calories per gram
- proteins = 4 calories per gram
- 1 pound of body weight = approximately 3500 calories

Discuss the implications of caloric density on foods consumed.

Ask the students to explain the relationship between intake and output of calories.

Lead students in brainstorming the benefits of exercise.
- raises metabolic rate
- uses more calories than at rest
- increases the percentage of muscle (muscle cells use more energy than fat cells)
- reduces stress
- reduces risk of certain diseases
- helps maintain weight
- increases energy level

Discuss exercise in relation to anorexia nervosa.

RESOURCES & MATERIALS

Handout: "Spending Calories"

"Appendix E: Food Composition Table"

"Heart Challenges," American Heart Association Schoolsite Program, High School

Samples of favorite snacks

TEACHER TIP

The aim of a nutritionally balanced diet is to keep the supply of food eaten for energy and health in balance with the body's need for proper nutrition.

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to understand responsible behavior and the interrelationship of diet, exercise, rest, and recreation.

SPENDING CALORIES

DIRECTIONS:

- The ***Calorie Use Chart*** below lists several activities and the approximate calories spent per hour by a 100, 125, 150, 175 and 200 lb. person doing a certain activity.
- Select five of the activities, preferably ones that you enjoy doing.
- On notebook paper, copy the formulas below and determine how many calories you would burn during these exercise activities.
- Use the weight column from the chart that is nearest your own weight.
- Remember these are estimated figures because everyone has a different metabolic rate.

DETERMINING CALORIE USE

EXAMPLE: Activity: Running (100-lb. person at 10 mph)
Number of calories per hour (850)
X Number of hours (1/2)
(425) calories used

Calorie Use Chart

ACTIVITY	Calories used per hour for a person weighing: 100 lb.	125 lb.	150 lb.	175 lb.	200 lb.
Bicycling, 6 mph	160	200	240	280	320
Bicycling, 12 mph	270	340	410	470	540
Jogging, 51/2 mph	440	550	660	770	880
Jogging, 7 mph	610	765	920	1074	1220
Jumping rope	500	625	750	875	1000
Running in place	430	540	650	759	860
Running, 10 mph	850	1065	1280	1494	1700
Swimming, 25 yds/min.	185	230	275	321	370
Swimming, 50 yds./min.	325	413	500	584	650
Tennis singles	265	333	400	467	530
Walking, 2 mph	160	200	240	280	320
Walking, 3 mph	210	265	320	374	420
Walking, 4 l/2 mph	295	368	440	514	590

© *Heart Challenges*, 1980
Copyright American Heart Association

American Heart Association

LESSON OBJECTIVE

Analyze the problems and symptoms associated with various eating disorders.

ASSESSMENT CRITERIA

Describe the symptoms of the different eating disorders, the damaging effects, and the treatment.

ACTIVITIES & STRATEGIES

Assign students to research and write the definitions of the terms ***anorexia nervosa, bulimia nervosa,*** and ***food binge.***

Distribute the handout, "Eating Disorders," assigning students to read and study it individually.

Discuss the following questions:
- What is the major cause of these eating disorders? (a preoccupation with weight loss and thinness)
- When did these disorders begin to appear? (These disorders began to appear after 1950.)
- Are men and women both affected by these disorders? (Out of every 20 young people with this disorder, 19 are female; however, the number of males is increasing.)
- What is the difference between anorexia nervosa and bulimia nervosa. (Refer to the handout.)
- Do some young people have a combination of the two eating disorders? (Yes)
- How dangerous can the eating disorders be to the individual? (They cause physical and mental problems and could lead to death.)
- What are the symptoms of anorexia nervosa and bulimia nervosa? (Refer to the handout.)
- What are the damaging effects of anorexia nervosa and bulimia nervosa? (Refer to the handout.)
- What is the treatment for anorexia nervosa and bulimia nervosa? (Refer to the handout.)

Assign the students to write a story of a friend with an eating disorder or report on someone in the media. The story or report should define the type of eating disorder, analyze the reasons, and suggest ways which the medical profession could help the individual.

RESOURCES & MATERIALS

Handout: "Eating Disorders"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Nutrition Education and Training videos:
- *Fear of Fat: Dieting and Eating Disorders*
- *Anorexia Nervosa: The Covert Rebellion*
- *Portraits of an Anorexic*
- *Eating Disorders: The Slender Trap*

Available from the NET library at this address:
Nutrition Education and Training Program
Texas Department of Human Services
The Library 434-W
701 West 51st Street
Austin, Texas 78769
(512) 450-3530

"Eating Disorders: When Thinness Becomes an Obsession," FDA Consumer, HHS Publication Number (FDA) 86-2211

TEACHER TIP

Discuss celebrities who have had eating disorders:
Jane Fonda—actress
Tracy Gold—actress
Gilda Radner—comic
Sally Field—actress
Ally Sheedy—actress
Sandra Dee—singer/actress
Karen Carpenter—musician

ESSENTIAL ELEMENT

Health. Concepts and skills that foster individual personal health and safety. The student shall be provided opportunities to develop patterns of food selection that contribute to wellness.

EATING DISORDERS

Definitions

Anorexia Nervosa is an eating disorder characterized by an obsessive and compelling desire to be thin.

Bulimia nervosa is characterized by binge eating and self-induced vomiting. A person with bulimia may use laxatives to rid his or her body of what is thought to be harmful.

Binge eating is an eating disorder that is characterized by the overindulgence of food without control or rational judgment about the amount being consumed.

Damaging Effects of Bulimia Nervosa

- *Damage to the esophagus*
- *Abnormal heart rhythms which can lead to sudden death*
- *Injury to the kidneys*
- *Bladder and kidney infections, often causing kidney failure*
- *Lacerations or tears to the stomach, caused by excessive vomiting*
- *Deterioration of tooth enamel*
- *Malnutrition*

Physical Symptoms of Anorexia Nervosa

- Deterioration of the body; especially muscle tissue
- Menstruation stops in females; impotency occurs in males
- Skin assumes dry, yellowish tint
- Low blood pressure
- Heart function inefficient due to the effect of starvation on hormones that regulate blood pressure
- Excessive hair growth on the body (possibly for warmth)
- Anemia & other signs of malnutrition
- Interrupted sleep patterns

Causes of Eating Disorders

Most scientific evidence suggests that there is a connection between biological and psychosocial factors that cause anorexia nervosa.

Dieting appears to trigger a process that progresses to self-starvation. The personality of the person who develops anorexia is generally conscientious, achievement oriented, and a perfectionist.

Bulimia nervosa almost exclusively affects young women and appears to be increasing in prevalence. This disorder occurs primarily in societies which place a high value on slimness.

Bulimia patients often suffer from depression and are four to five time more likely to be chemically dependent.

Treatment for Eating Disorders

- *Medical personnel are involved in the diagnosis and treatment of the medical complications that arise from prolonged starvation.*
- *Psychiatric or psychological personnel are involved in treating the self-defeating behaviors that reinforce severe eating disorders.*
- *Dietitians are involved in providing nutrition counseling for the patient to help with weight gain and the return to normal eating patterns.*

LESSON OBJECTIVE

Analyze nutrition information on food labels.

ASSESSMENT CRITERIA

Recognize how food laws help the nutrition of the individual and the nation.

Health **High School**

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Present to the class the information in the opposite column about laws that ensure food safety.

Write each of the following terms and the corresponding definition found in "Appendix G: Glossary of Terms" on a card and assign a student to present each term to the class:

- ***whole-grain***
- ***refinement*** of breads and cereals
- ***enrichment*** of breads and cereals
- ***fortification*** of breads and cereals
- ***restoration***

Provide several empty cereal boxes. Allow time for each student to evaluate at least one cereal box label for:

- whole-grain products
- enrichment or fortification
- nutrients received from different forms of cereals
- sugar or different names for sugar

Demonstrate the preparation of quick-cooking oatmeal, regular oatmeal, and instant oatmeal, using a microwave oven or a hot plate.

Allow students to taste all three kinds of oatmeal to compare the flavor, texture, and nutrients of each type.

Discuss the students' preferences and the nutritive value of each type of oatmeal.

- Are they comparable in taste?
- Are they comparable in nutritive value?
- Does one contain more sugar?

RESOURCES & MATERIALS

Hot plate or microwave
Regular, quick-cooking, and instant oatmeals
Empty cereal boxes
Plastic spoons for sampling oatmeal
Sugar, margarine, and small amount of milk
Cinnamon, raisins, nuts (optional)

Information for the teacher:
There are many local, state, and federal agencies that regulate the safety of the food produced and eaten in the United States. Some laws have been passed ensuring that:

- labeling is truthful
- products are safe, pure, and wholesome
- products are processed under sanitary conditions
- the public is informed about food enrichment

In 1942, the Enrichment Act required the enrichment of breads and cereals. The law called for four nutrients to be returned to white flour:

- iron, a mineral
- thiamin, a B vitamin
- niacin, a B vitamin (Thiamin and niacin were restored to levels found in whole wheat.)
- riboflavin, a B vitamin (added to a higher level than found in whole wheat)

This was an example of how the government, nutritionists, public health officials, and food industries cooperated for the benefit of the consumer.

ESSENTIAL ELEMENT

Health. Health-related concepts and skills that affect the well-being of people collectively. The student shall be provided opportunities to describe the wide range of resources designed to protect and promote the well-being of people.

LESSON OBJECTIVE

Distinguish between reliable and unreliable sources of nutrition information.

ASSESSMENT CRITERIA

Determine the reliability of nutrition information.

Health **High School**

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Introduction to students:

- A variety of resources are available to provide reliable nutrition information.
- Information is an important resource for understanding nutrition.
- Sometimes it is difficult to determine which resources are reliable and which are not.

Discuss the criteria for determining the reliability of nutrition information listed in the opposite column with the students.

Review with the students the "Sources of Reliable Nutrition Information" on page 72 of the "Instructor's Resource Guide for Teaching Nutrition Education" which is found in the introductory section of *ESR IV*.

Divide the students into groups. Give each group a nutrition information book, a nutrition journal, a newspaper article, or a magazine article on nutrition to evaluate.

Distribute the worksheet, "The Truth of the Matter," to the students.

Instruct each student to complete the worksheet as the group evaluates the book or article.

RESOURCES & MATERIALS

Worksheet: "The Truth of the Matter"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Nutrition information books
Nutrition journals
Magazine articles
Newspaper articles

Criteria for determining the reliability of nutrition information:

- Did the author receive nutrition training from a recognized university?
- What type of experience has the author had and is the author presently working with a reliable nutrition agency or institution?
- Do professional medical societies or professional nutritionists endorse the book?
- Did the author list footnotes listing nutrition or medical books and journals?
- Is the book included on the list of a professional group such as the state or local cancer, heart, or dietetic association?
- Is the information consistent with basic concepts of nutrition and health or does it claim to cure medical conditions or exaggerate virtues of individual foods?

ESSENTIAL ELEMENT

Health. Health-related concepts and skills that affect the well-being of people collectively. The student shall be provided opportunities to be aware of community health resources and activities.

NAME ______________________________ **DATE** ________________

The Truth of the Matter

Complete the following questions using a magazine or a newspaper article on nutrition, a nutrition-related book, or nutrition or medical journals.

1. What is the author's name?
2. From what university or institution did the author received training?
3. In what subject was his or her training?
4. With whom is the author associated at the present time?
5. List the professionals who have endorsed the article or book.
6. List any names of nutrition experts from whom the author received advice or assistance.
7. Give examples of the footnotes listing reliable nutrition or medical books.
8. Is the book on the acceptable list of a professional group such as the American Heart Association or the American Cancer society?
9. Does the article make claims to cure medical conditions or is the information consistent with the basic concepts of nutrition and health?
10. Write a brief synopsis of an article or a portion of a book.

11. Nutrition articles are included in many newspapers and household magazines. Often there is very little information given about the author of these articles. How can you determine if this information is reliable?

Language Arts **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Explain the physiological, psychological, and social implications of food.

ASSESSMENT CRITERIA

Identify factors that influence food choices.

ACTIVITIES & STRATEGIES

Write the following terms from the Teacher Resource, "Physiological, Psychological, and Social Implications of Food," on the chalkboard:

resources
religion
advertising
peers
family traditions
individual differences
values
food availability
senses
family
social

Allow students to define these terms, then use the information found in the teacher resource to supplement and discuss their definitions.

After the discussion, divide students into small groups to brainstorm reasons for choosing certain foods and to determine whether the reasons are physiological, psychological, or social reasons. As the group brainstorms, each student should list the reasons that apply to them on paper. Next, each student should categorize his or her reasons using the terms on the chalkboard.
Examples:
Like to eat with friends: peers (psychological, social)
Have to eat what parents prepare: family (psychological)
Limited amount of time: value or resources (psychological)
Hunger: senses (physiological)

Ask the students to write a composition entitled, "Reasons for My Food Choices," which summarizes the physiological, psychological, and social implications on food choices. The students should use their lists as the basis for their writing.

After completion, ask some students to share their summaries with the class.

RESOURCES & MATERIALS

Teacher Resource: "Physiological, Psychological, and Social Implications of Food"

ESSENTIAL ELEMENT

Language arts. English I. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provided opportunities to prewrite and plan for specific purposes and modes, using material from sources such as personal experience and literature and using idea-generating strategies, including conferencing were appropriate.

Physiological, Psychological, and Social Implications of Food

Resources
Time, money, energy, and facilities

Values
If a person values good health, he or she will select food that will contribute to looking and feeling good.

Religion
Religious practices sometimes influence the types of food which are eaten.

Food availability
Food availability is based on location, climate, and transportation. Time available for shopping and preparing the food and the budget allocation for food also determines the availability of food.

Advertising
Advertising provides product information and misinformation. The advertising also makes the company's product more appealing.

Senses
The flavor of the food, the aroma, the appearance, the size and shape of the food, the feel and sound, and the color of food will cause the food to appeal to an individual or to be rejected.

Peers
Peers often influence eating patterns during high school years. Some examples are fad diets, fast foods, and skipping meals.

Family
Families originally ate all meals together and discussed the day's activities. Some families still eat at least one meal a day together and others are unable to eat any meals together. Some family members enjoy cooking and others prefer eating out.

Family traditions
Many food patterns and habits are passed from generation to generation. Some patterns such as the method of cooking are very difficult to change.

Social
Food brings family and friends together, and business is often transacted over lunch. These groups also affect the kind of food which one eats.

Individual differences
Personal preferences and emotions, allergies, health problems, and concerns about weight will affect food choices.

LESSON OBJECTIVE

Distinguish between nutrition facts and fallacies.

ASSESSMENT CRITERIA

- Realize the merits of an individual food.
- Gain experience in preparing and presenting a debate.

ACTIVITIES & STRATEGIES

Conduct team debates on the pros and cons of topics such as:
- There is not a single perfect food.
- All sweets are considered bad foods.
- There is not a single food that is bad for you.
- Milk is the perfect food.
- A vegetarian diet is healthier than a diet that includes meat.

Allow students to choose a topic and decide which side they want to argue. If any topic has students assigned to the *pro* viewpoint but not the *con* viewpoint, assign students to argue the opposing view. Tell the teams to research the topic in order to have facts to support their arguments.

Direct the class to evaluate the effectiveness of each team of debaters based on the following criteria:
- Were the views represented truthfully with no misleading statements?
- Were both sides of the issue represented well?
- Did students on both sides take part in the discussion?
- Did students on both sides try to persuade the audience to accept their view?
- Did students on both sides have facts to support their arguments?

RESOURCES & MATERIALS

Library references

TEACHER TIP

The outcome of the lesson should be that there are no single foods which are *perfect* and no single foods which are *bad*. A food becomes *bad* when we eat too much of it and eat it too often.

ESSENTIAL ELEMENT

Language arts. Debate I, II, III. Written single-issue briefs. The student shall be provided opportunities to brief affirmative or negative arguments in outline forms.

LESSON OBJECTIVE

Discuss the Dietary Guidelines for Americans.

ASSESSMENT CRITERIA

Compose a letter describing the Dietary Guidelines for Americans.

Language Arts **High School**

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Discuss with the students the following information regarding the Dietary Guidelines for Americans:

- Americans eat too much fat, sugar, and sodium, and too little fiber.
- At least forty percent of Americans are overweight.
- These factors have been linked to health problems such as cancer, high blood pressure, heart disease, and diabetes.
- The United States government developed the Dietary Guidelines for Americans to encourage people to improve their eating habits.

Instruct the students to write a letter to a foreign exchange student who will soon be arriving in their hometown. The students should describe the eating habits of Americans, favorite foods, positive aspects of eating in America, and negative aspects or problems of the American diet.

Upon completion of the writing activity, ask the students to brainstorm some recommendations to Americans on how to improve their eating habits.

Distribute "Appendix F: Dietary Guidelines for Americans" and ask students to compare them with their recommendations.

Discuss any similarities or differences.

RESOURCES & MATERIALS

Handout: "Appendix F: Dietary Guidelines for Americans"

"Heart Challenges," American Heart Association Schoolsite Program, High School

---

ESSENTIAL ELEMENT

Language arts. English II. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provided opportunities to prewrite and plan for specific purposes and modes, using material from sources such as personal experience and literature and using idea-generating strategies, including conferencing where appropriate.

LESSON OBJECTIVE

Recognize the effects of food on health and appearance.

ASSESSMENT CRITERIA

- Recognize the advantages of good health.
- Evaluate needed changes in the diet.

Language Arts **High School**

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Our bodies need exercise, sleep, and a nutritionally balanced diet. The decision for good health or poor health is a decision which you must make throughout your life.

Good health is reflected in our behavior, actions, and appearance. Discuss the signs of good health and poor health. Suggestions for discussion are listed in the opposite column.

Display and discuss the transparency, "Appendix F: Dietary Guidelines for Americans."

Recall the movie, "Gone with the Wind." Summarize the last event with Scarlet O'Hara, as Rhett Butler left and Scarlet sat on the beautiful stair steps. She rested her head on her arm on the step above and stated in a tired but self-assured voice, "Tomorrow is another day." She would solve her problems then.

Tomorrow is another day for you, and for better health. Evaluate your health and your health habits. What improvements need to be made? Justify your reasoning.

Instruct the students to choose an older person (parent, grandparent, aunt, uncle, neighbor) and ask about some changes that they would make in their diet if they could go back in time. Take notes of their conversation, if necessary.

Tell students to write a report that includes this information and give a title to the report.

RESOURCES & MATERIALS

Transparency: "Appendix F: Dietary Guidelines for Americans"

Signs of good health:

- posture—body held erect when sitting, standing, or walking
- weight—normal body weight for height and body structure
- skin—clean and smooth with a fresh, natural color
- hair—shiny and clean
- eyes—clear and bright
- sleep—rests well
- attitude—positive outlook on life, alert
- behavior—can cope with daily stress, has realistic goals in life
- health—seldom ill, has energy

Signs of poor health:

- posture—body slumps when sitting, standing, or walking
- weight—underweight or overweight
- skin—flaky, poor color, does not heal easily
- hair—dull, dry, breaks easily
- eyes—dull, red, itching
- sleep—difficulty sleeping or excessive sleeping
- attitude—negative outlook on life, moody, depressed
- behavior—lack of incentive, no initiative to face everyday life
- health—becomes ill easily, lacks energy

ESSENTIAL ELEMENT

Language arts. English IV. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provide opportunities to prewrite and plan for specific purposes and modes, using material from sources such as personal experience and literature and using idea-generating strategies including conferencing where appropriate.

Language Arts **High School**

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Explore the influence of food advertising and the media on food habits.

ASSESSMENT CRITERIA

Analyze the influences of food advertisements in the mass media on our food choices.

ACTIVITIES & STRATEGIES

Present this information to the students:

- Mass media such as television, radio, magazines, and newspapers can affect your food selections.
- The mass media introduces new food products, reminds you about certain types of food, and informs you of new food products.
- Mass media appeals to your curiosity, to your desire to belong, to your sense of pride, and provides coupon rebates and special introductory offers.

As a homework assignment or a class activity, assign students to view television or look through magazines and newspapers for food and beverage advertisements. They should record their findings on the worksheet, "Advertisements and the Media."

Discuss the following questions:

- What food groups from "Appendix C: A Pattern for Daily Food Choices" do the advertised food items represent? Do the advertised food items fit into an "other" group?
- What celebrities advertised the food item?
- How do television celebrities influence food choices? Give some examples.
- Which of the food items are sources of dietary fiber?
- Which food items would be considered nutritious?
- Which food items are low in sugar?
- Which food items are low in salt?
- What other messages were represented?

If time permits, ask students to share information recorded on the worksheet.

Assign each student, groups of students, or the whole class to develop an audio/visual advertising promotion for the School Lunch Program.

RESOURCES & MATERIALS

Worksheet: "Advertisements and the Media"

"Appendix C: A Pattern for Daily Food Choices"

"Heart Challenges," American Heart Association Schoolsite Program, High School

Magazines
Newspaper

In advance, check with the cafeteria manager or food service director on background information on the School Lunch Program for the advertising campaign.

ESSENTIAL ELEMENT

Language arts. English I. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provided opportunities to support and development of a central idea through clear and logical thinking.

NAME ______________________________ **DATE** ________________

Advertisements and the Media

Watch television on the major networks or look through magazines and newspapers for food and beverage advertisements. Analyze the advertisements and complete the following chart.

Time of TV viewing, name of magazine or newspaper	Message of advertisement	Number of food advertisements	Names of foods advertised	Number of times each food advertised	Age group focus of advertisements	Names of celebrities on advertisements

Total number of food advertisements ______________________

Language Arts **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Discuss family food preferences.

ASSESSMENT CRITERIA

Analyze the reasons for food preferences of a family.

ACTIVITIES & STRATEGIES

Introduce the following information to the class:
People eat to stay alive. Even though food is essential for our survival, food is also a source of pleasure and satisfaction. There are many reasons why we select the foods we eat. Discuss these reasons with the students while displaying the transparency, "Family Food Preferences."

Review with the students:
The United States has a variety of cultural patterns which influence our diet to be a blend of foods. As we travel and visit friends, we broaden our knowledge and learn to enjoy a variety of foods.

Assign the students to write a letter to a pen pal in another country informing him or her about:

- the types of food which your family chooses to eat and the reasons for the selection
- different types of cultural foods that you enjoy
- general information about the preparation of the foods such as the use of convenience foods, home-cooked meals, and eating out in restaurants and fast food places
- where the food is purchased such as fruit stands, supermarkets, food grown locally, shipped in from other parts of the U.S. or other countries
- number of meals eaten daily and the methods of serving meals in your home
- other interesting information about your family

After completion, ask some students to tell the class about their letters.

RESOURCES & MATERIALS

Transparency: "Family Food Preferences"

Overhead projector

TEACHER TIP

For information on pen pals, write:
International Youth Service
PB 125
SF 20101
Turku, Finland
You could also check with the local social studies curriculum director.

ESSENTIAL ELEMENT

Language arts. English II. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provided opportunities to prewrite and plan for specific purposes and modes, using material from sources such as personal experience and literature and using idea-generating strategies.

Family Food Preferences

Reasons for choosing the foods we eat:

- regional location and climate
- cultural beliefs
- ethnic groups
- values (health, life, family members, money)
- religious beliefs and customs
- economic status
- pleasant or unpleasant associations
- peer pressure
- social pressure
- familiar method of cooking (broiling, frying, roasting, and stir-frying)
- parents' likes and dislikes
- parents' vocation and work hours
- size of family
- size of kitchen and serving area

LESSON OBJECTIVE

Examine food traditions at home and around the world.

ASSESSMENT CRITERIA

- Identify the factors which make up our culture.
- Identify the differences in the food patterns of different people.

ACTIVITIES & STRATEGIES

Discuss the following information with the students:

- definition of *culture*
- examples of different cultures
- factors that determine a culture
- reasons there are so many cultures in America

Present to the class:

- Culture may be a major determination of food habits.
- What we learn to eat depends on where we live and how we have grown up.
- We learn the language, social customs, moral codes, and food habits of the culture.
- Cultural habits change with the surroundings and with time. A student who grows up in a Mexican-American home in Texas will have food habits different from one who grows up in a German-American home in Centerville, New York.

Distribute the handout, "Cultural Food Patterns," and discuss the food patterns of the cultures.

Select one cultural group and research information about the culture.

Instruct the students to write a composition that:

- describes the cultural influences and the food patterns of the cultural group
- identifies the food groups represented by the foods common to the culture
- explains the nutritional contributions of the culture's different foods

RESOURCES & MATERIALS

Handout: "Cultural Food Patterns"

"Appendix C: A Pattern for Daily Food Choices"

"Appendix E: Food Composition Table"

Nutrition, Food and Culture. National Live Stock and Meat Board, Chicago, Ill. 60611.

Encyclopedia and other library resources

TEACHER TIPS

- **Definition of culture:**
  The sum of ideas, beliefs, and habits of a group of people at a given time
- **Examples of culture:**
  Egyptian, American, Jewish
- **Examples of factors included in a culture:**
  - **Ethnic background: Italian, Jewish, Spanish American**
  - **Race: Irish, Asian, African**
  - **Religion: Catholic, Jewish, Protestant**

ESSENTIAL ELEMENT

Language arts. English II. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes in a variety of modes. The student shall be provided opportunities to prewrite and plan for specific purposes and modes, using material from sources such as personal experience and literature and using idea-generating strategies, including conferencing where appropriate.

Cultural Food Patterns

Cultural Group	General Characteristics	Examples of Cultural Foods
Native American	• Early Indians were healthier than 16th century Europeans. • The nutritive content of the diet decreased after migration to the cities and reservations. • Dietary staples include dry beans and flat breads. • The differences between tribes and tribal locations contribute to the varied diets found among the Native Americans.	• **Beans, berries, corn, fish, nuts, squash, and wild game** are staples of the diet. • Foods vary from tribe to tribe, but sheep or goat meat (also called **mutton**) is common. • Southwest Indians eat flat corn breads called **tortillas**. • **Pemmican** - a partially dried product made of mixed berries, cereals, meats, and sugar. • **Wajapi** - a pudding made from ground, dried wild berries or raisins that are cooked with cornstarch and sugar.
Chinese	• Food is cooked quickly due to the scarcity of fuel. • Natural flavors and textures are retained during cooking. • Rice is a staple food served at most meals.	• **Egg foo yung** - an egg and meat omelet. • **Egg rolls** - a thin dough, filled with meat and vegetables, and then fried. • **Stir-fried vegetables and meat** - a quick method of cooking that uses very little fat. Meats and vegetables are chopped into very small pieces. Chow mein and chop suey are American creations.
Italian	• Bread and pasta are staples of southern Italian meals. • Rice and cornmeal are staples of northern Italian meals. • Cheese is popular. • Adults seldom drink milk.	• **Baccalia** - a dish of salted codfish that is cooked with herbs and tomato sauce. • **Cold cut meats** - **coppa** (a peppered sausage), **prosciutto** (dry-cured ham), and **salami** are common. • **Insalata** - a salad made of greens served with an oil and vinegar dressing. • **Pasta** - many varieties and shapes of this popular food are used. • **Polenta** - cornmeal cakes.
Mexican	• Mexican foods are a blend of influences from the Spanish and the Native Americans. • The most popular diet consists of chili, corn, dried beans, and peppers. • Little milk is consumed. • Limited amounts of eggs, fish, and meat are eaten.	• **Chicos** - steamed green corn on the cob. • **Chili con carne** - a main dish of beans, beef, and peppers that have been cooked together. • **Posole** - whole grain corn, treated with lime. • **Refried beans** - calice beans or kidney beans that have been cooked twice with fat. • **Tortillas** - flat, thin, cornmeal or flour cakes.

LESSON OBJECTIVE

Determine the relationship between nutrition and weight control.

ASSESSMENT CRITERIA

Enumerate the positive ways to help an individual control his or her weight.

Language Arts **High School**

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Present and discuss the following *Tips to Healthful Weight Control* with the students:

- Each morning when you wake up, tell yourself that you are a terrific person.
- Drink six to eight glasses of water a day. For best results, this should be water, not coffee, tea, or soft drinks.
- Eat a wide variety of foods. Do not label foods as bad or good.
- Concentrate on eating a nutritionally balanced diet, not on weight.
- Exercise four to five times a week to lose weight, and three to four times a week to maintain weight.
- Eat at the table with family or friends.
- Do not eat while doing other activities such as playing cards or watching television.
- Learn to prepare food by broiling, boiling, or baking. Limit fried foods.
- Limit lunch meats and hotdogs because they are usually high in fat.
- Increase your fiber intake by eating more fresh fruits and vegetables.
- Try having one non-meat day a week; cheese pizza and other low-fat dairy products could be substituted.
- Do not link your weight loss to a special event such as the prom or vacation.
- Plan your menus for the week, make a grocery list, and buy your groceries from this list.
- Weigh yourself only once a week.
- Do not skip meals.
- Eat fruits or vegetables to keep from getting too hungry.
- Allow a reasonable amount of time to achieve your desired weight loss.

Tell students to study the list and to analyze their own eating habits. Assign each student to write a descriptive, narrative report on ways to improve his or her eating habits to control weight now and in the future.

RESOURCES & MATERIALS

TEACHER TIP

The list of *Tips to Healthful Weight Control* could be made into a transparency and used on an overhead projector or could be copied and given to the students as a handout.

ESSENTIAL ELEMENT

Language arts. English II. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provided opportunities to prewrite and plan for specific purposes and modes, using material from sources such as personal experience and literature and using idea-generating strategies including conferencing where appropriate.

LESSON OBJECTIVES

- Evaluate the claims made by promoters of fad diets.
- Distinguish between nutrition facts and fallacies.

ASSESSMENT CRITERIA

Determine the reliability of diet claims.

ACTIVITIES & STRATEGIES

Discuss the following common characteristics of fad diets:
- Fad diets claim quick weight loss.
- Fad diets restrict food selection and enforce rituals that are not realistic; for example, eating only fruit for breakfast.
- Fad diets usually require more money, specific products, or a strict regimen.
- The dieter does not necessarily have any input into the program followed.
- The fad diet program often does not allow for individual differences.
- Fad diets use the names of famous people and cities, like Hollywood, to add appeal and authenticity to their claims.
- Fad diets and diet programs generally do not teach lifelong, healthy eating habits.
- Ninety-five percent of people who lose weight on a fad diet regain the weight.
- No diet will cause a permanent weight loss unless exercise is part of the weight-loss program.

Examples of fad diets:
- Popcorn Plus Diet
- Fit for Life
- Stewardess Diet
- Mayo Diet
- Low-carbohydrate Diet
- Doctor's Quick Weight Loss Diet
- Beverly Hills Diet

Refer to opposite column for additional diets.

Instruct students to research a fad diet or a weight-loss program and write a paper evaluating the program for nutrition, possible side effects, dangers, and other factors.

After completion, ask some students to report on their selected diets to the class.

RESOURCES & MATERIALS

Library

Reliable sources of nutritional information:
- Food and Drug Administration
- Texas Department of Health
- Texas Agricultural Extension Service
- United States Department of Agriculture
- Dietitians and other health professionals
- Professional journals

Additional examples of fad diets:
- Fasting: The Ultimate Diet
- Calories Don't Count
- Bloomingdale's Eat Healthy Diet
- Rice Diet
- Last Chance Diet
- Scarsdale Diet
- Cambridge Diet
- I Love New York Diet
- Dr. Stillman's Quick Weight Loss Diet

TEACHER TIP

This activity may take more than one class period for research, writing, and reporting.

ESSENTIAL ELEMENT

Language arts. English I. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provided opportunities to draft compositions for specific audiences and purposes in a variety of modes: paragraphs, multi-paragraph compositions, multi-paragraph compositions incorporating information from sources other than personal experience.

Language Arts High School

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Analyze the problems and symptoms associated with various eating disorders.

ASSESSMENT CRITERIA

Describe performers who have been associated with having various eating disorders.

ACTIVITIES & STRATEGIES

Part 1 of a two-part lesson (eating disorders)

Point out the Damaging Effects of Bulimia Nervosa and the Physical Symptoms of Anorexia Nervosa which are listed in the opposite column.

Review some of the characteristics of people with bulimia nervosa.

- They participate in binge eating followed by purging. Purging is an attempt to remove food from the body either by self-induced vomiting or the continual use of laxatives.
- They secretly binge and purge.
- They desire perfection.
- They turn to food in a crisis.
- They have a history of dieting and weight gain during the teen years.

Discuss the reasons that a career in the entertainment field could cause a tendency to develop an eating disorder. (Possible reasons: the stress of the lifestyle, striving for perfection, importance of figure and appearance, and not eating properly)

Ask the students if they know of any musicians or performers who have problems with eating disorders. What would a performer need to do to prevent the development of an eating disorder?

Assign students to find articles on musicians, actors, or athletes who have had eating disorders such as anorexia nervosa or bulimia nervosa. Assess the celebrities' success, the publicity which the media gave their careers, and their problems with the eating disorders. Discuss the reasons that eating disorders were a part of their lives.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Damaging Effects of Bulimia Nervosa:

- damage to the esophagus
- abnormal heart rhythms
- injury to the kidneys
- bladder and kidney infections, possibly causing kidney failure
- lacerations or tears to the stomach caused by excessive vomiting
- damage to tooth enamel
- malnutrition

Physical Symptoms of Anorexia Nervosa:

- deterioration of the body; especially muscle tissue
- menstruation stops in females; impotency occurs in males
- skin assumes dry, yellowish tint
- low blood pressure
- heart function becomes inefficient due to the effect of starvation on hormones that regulate blood pressure
- excessive hair growth on the body
- anemia
- interrupted sleep patterns; bad dreams

TEACHER TIP

A few famous people who have had problems with eating disorders include:
Karen Carpenter—musician
James Coco—actor
Willie Shumacher—jockey
Jane Fonda—actress
Ally Sheedy—actress
Sally Field—actress
Gilda Radner—comic
Cathy Rigby—gymnast
Sandra Dee—singer/actress

ESSENTIAL ELEMENT

Language arts. Correlated language arts II. Integrated literature and reading concepts and strategies. Using meaningful, culturally diverse pieces of literature, the student shall be provided opportunities to develop comprehension skills by analyzing a piece of text to identify the stated and implied main ideas and to develop a summary and perceiving cause and effect relationships.

Language Arts High School

H
S

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Analyze the problems and symptoms associated with various eating disorders.

ASSESSMENT CRITERIA

Write an article about eating disorders.

ACTIVITIES & STRATEGIES

Part 2 of a two-part lesson (eating disorders)

Discuss the following questions:
- Do eating disorders have damaging effects only on physical health?
- What percent of young women are affected by anorexia nervosa?
- Are men affected by anorexia nervosa or bulimia nervosa?

After the background information from part one of this lesson has been presented and discussed, instruct students to write articles for the school newspaper about eating disorders.

Tell students that one or two articles will be submitted to the school newspaper.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Dying to Be Thin by Ira Sacker and Marc Zimmer

Nutrition Education and Training Program videos:

Anorexia Nervosa: The Covert Rebellion
Bulimia: Out of Control Eating
Fear of Fat: Dieting and Eating Disorders

Available from the NET library at this address:
Nutrition Education and Training Program
Texas Department of Human Services
The Library 434-W
701 West 51st Street
Austin, Texas 78769
(512) 450-3530

TEACHER TIP

Remind students about the sensitive nature of this topic and to select words and phrases carefully.

ESSENTIAL ELEMENT

Language arts. Correlated language arts II. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provided opportunities to draft composition for specific audiences and purposes in a variety of modes; expressive, informative, persuasive, and literary purposes, including character sketches and stories as forms of literary discourse.

Language Arts High School

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Assess the role of vitamin and mineral supplements.

ASSESSMENT CRITERIA

Identify cases when vitamin and mineral supplements are needed in human nutrition.

ACTIVITIES & STRATEGIES

Discuss the reasons that vitamin and mineral supplements are added to foods:

- to replace nutrients lost in processing, as in enriched flour
  - vitamin A in margarine and some forms of milk
- to improve nutritional quality
  - vitamin D in milk
  - potassium iodide in salt
  - corn meal enrichment
  - fortified cereals

Define the term ***megadose***, and discuss the following information with the students.

- Megadoses are large self-prescribed doses of nutrients, usually vitamins, for treatment or prevention of an ailment.
- One disadvantage of megadoses is that vitamins are needed in small amounts to manufacture coenzymes; when megadoses are taken, the vitamin cannot function properly, but instead acts as a drug. If the vitamin is water soluble, the excess will be excreted in the urine; if it is fat soluble, it will be stored or will perform a non-vitamin chemical function.

Why do people feel the need to use vitamin supplements?

- Some vitamin fans want ***supernutrition***.
- Some are afraid their snack food, fast food, or processed food diets are deficient in essential nutrients.
- Some think vitamins or minerals prevent diseases.

Who needs vitamin and mineral supplements:

- elderly who are not eating well
- some pregnant women
- individuals with gastrointestinal malabsorption problems
- strict vegetarians
- people who have diseases, infections, or injuries

Where can one obtain needed vitamins and minerals?

- fresh and nutritious food
- follow "Appendix C: A Pattern for Daily Food Choices"

Assign the students to write an essay on "Our Search for the Fountain of Youth." After completion, ask some students to tell the class about their essays.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Additional information on megadoses:

- Some health food store advertisements or health or diet books will testify to the "cure" or improved state brought on by taking megadoses, but the results should come from scientific test groups and not from an individual who says, "I feel better" or "I look better."
- Americans spend over a billion dollars yearly on megadose food supplements which are unnecessary.
- The Food and Drug Administration prohibited over-the-counter sales of megadose vitamin A and D supplements because of their toxicity. People protested and Congress rescinded the regulation.
- Megadoses of certain nutrients can negatively affect how the body metabolizes other nutrients.

ESSENTIAL ELEMENT

Language arts. English III. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provided opportunities to draft compositions reflecting rhetorical choices based on specific audiences, purposes, and modes, expressive, informative, persuasive, and literary purposes.

Language Arts **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVES

- Review current events in the field of nutrition.
- Analyze nutrition information on food labels.

ASSESSMENT CRITERIA

Analyze the difference between different types of reduced-calorie salad dressing.

ACTIVITIES & STRATEGIES

Present the following information about reduced-calorie dressings:

- One tablespoon of regular salad dressing can add as many as 80 calories to a salad.
- A tablespoon of regular dressing contains six to nine grams of fat.
- Sales of reduced-calorie dressings increased 22 percent or $64 million in the last quarter of 1989 compared to 1988 sales.

Terms used on reduced-calorie dressing labels include:

- *Reduced calorie*: at least one-third fewer calories and less fat.
- Reduced-calorie dressing must carry a nutrition label and must compare calories, but is not required to show grams of fat.
- *Light or lite*: no legal definitions of this term; meets requirement of reduced calories; compares calories and fat grams
- *Oil-free*: contains no oil, so it contains no fat and is cholesterol free unless egg yolks are included.
- *Free everything*: the newest trend and the most confusing; labels say *91 percent fat-free, cholesterol-free, nonfat*, or *reduced-calorie*. These products usually contain fewer calories than plain reduced-calorie products.
- Some labels say *cholesterol free*, but all vegetable oils are cholesterol free.
- Some dressings are sodium-free, but only if the label states this. The sodium content in dressings is sometimes very high.

Salad dressings with less than three grams of fat per tablespoon are a good choice. If more than three tablespoons of dressing are used on a salad, then select those with zero fat grams.

Assign the students to write simple, compound, and complex sentences using the above information. Tell them to label each sentence *simple, compound*, or *complex*. After completion, ask students to state their sentences and the type of sentence it is to the class.

RESOURCES & MATERIALS

Chalkboard or overhead projector if teacher chooses to write information on a transparency

TEACHER TIPS

- **Ask students to copy labels from salad dressings found at home and bring them to class. Labels from different companies will vary even if they are labeled *Lite* or *Reduced Calorie*.**
- **Ask students to write the Food and Drug Administration for better definitions of labels.**
- **Advise students that some of the "fast food" salad dressings have from 250 to 460 calories per packet.**

ESSENTIAL ELEMENT

Language arts. English I. Integrated writing and language concepts and skills, using written and oral composing processes to plan and generate both oral and written compositions for a variety of purposes and in a variety of modes. The student shall be provided opportunities to revise compositions using self-assessment, peer interaction conferences, and individualized techniques, revise by combining sentence parts and sentences to produce a variety of sentence structures, including simple, compound, and complex, to convey intended meaning.

LESSON OBJECTIVE

Compare the nutritive value of foods.

ASSESSMENT CRITERIA

- Determine total calories from food.
- Determine the percentage of calories in food that comes from fat.

ACTIVITIES & STRATEGIES

Discuss the following information with the students:

- A ***calorie*** is the unit used to measure the amount of energy found in food. A calorie is the amount of energy needed to increase the temperature of one cubic centimeter of water 1° Celsius.
- The higher the calorie count of any given food, the more energy it contains and the longer it will take for your body to burn it off. A high-calorie, high-fat food, like a cheeseburger, which has 310 calories, takes longer for your body to digest than a low-calorie, low-fat food, like an apple, which has 75 calories.
- Three nutrients contribute to the energy value or calories of food: fat, protein, and carbohydrates. Since these three nutrients contain calories and provide energy, they are often referred to as the energy nutrients. Complex carbohydrates are the ideal energy source because they are the easiest for the body to use of the three energy nutrients.
- The calories in most foods come from a combination of all three energy nutrients; for example, with bread, 75 percent of its calories come from carbohydrate, 13 percent from protein, and 12 percent from fat. Some foods contain only one or two of the three energy nutrients. A T-bone steak is made up of 63 percent of calories from protein and 37 percent from fat; calories from butter are 100 percent from fat.

Read the text of the transparency, "Determining Total Calories." Help the students determine the total calories of a slice of bread. The answers are located in the next column.

(continued in the opposite column)

Adapted from:
"Changing the Course: Secondary Curriculum," American Cancer Society, pp. 68-70, 81.

RESOURCES & MATERIALS

Transparency: "Determining Total Calories"

"Changing the Course: Secondary Curriculum," American Cancer Society

(continued from left column)

Review the method of determining the percentage of calories from fat shown on the transparency. Instruct the students to calculate the percentage of fat in the following food items:

- One hot dog—13 grams of fat and 140 calories (84%)
- One slice of whole wheat bread—1.2 grams of fat and 68 calories (16%)
- One cup of low-fat milk (2 percent)—4.7 grams of fat and 121 calories (35%)

ANSWER KEY

1. 50
2. 9.2
3. 8.1
4. 67.3
5. 12%

TEACHER TIP

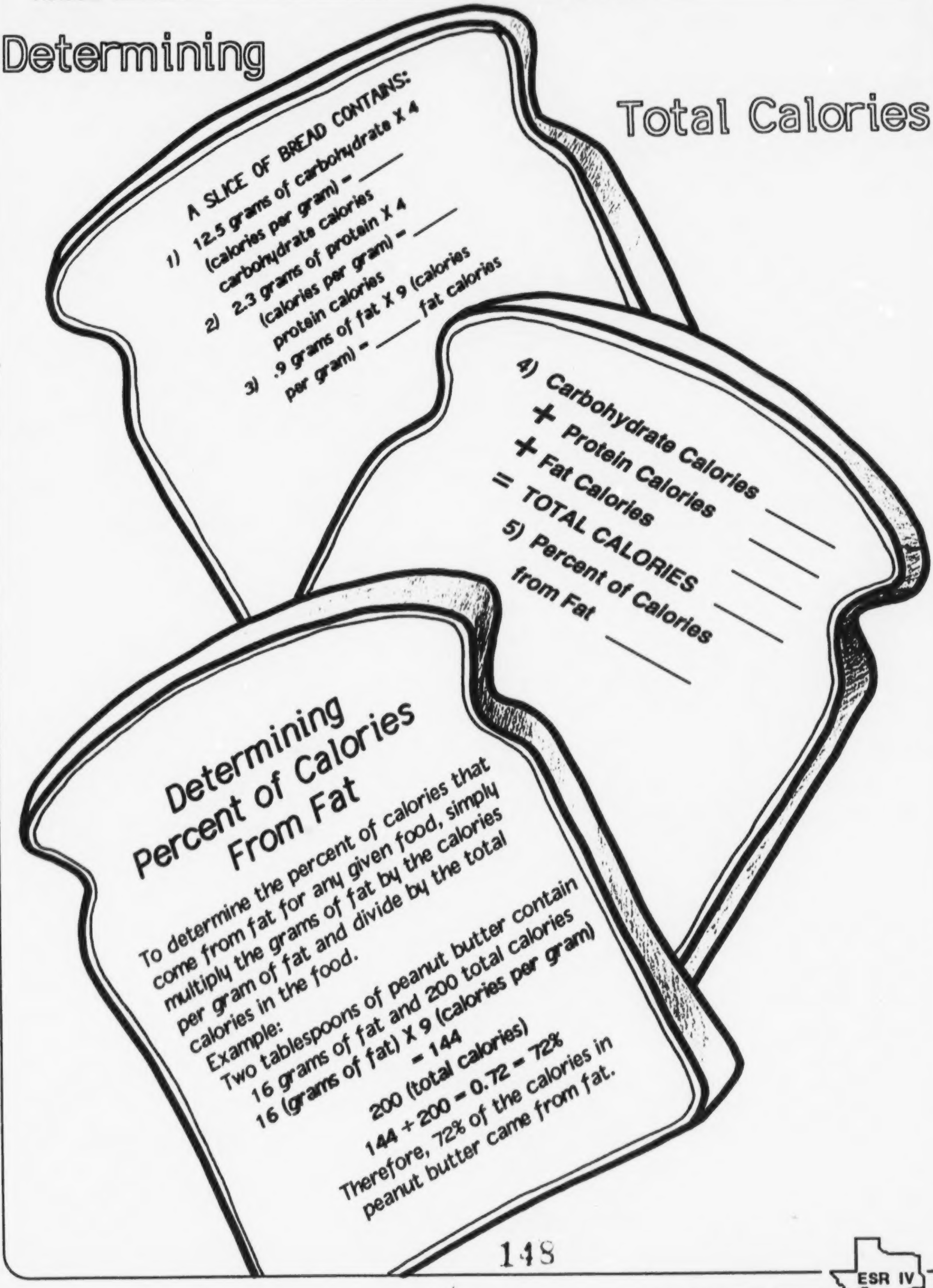
The easiest thing for the body to do with fat calories is to convert them to body fat. It only takes three calories of energy to store 100 fat calories, but it takes 23 calories of energy to store carbohydrates.

ESSENTIAL ELEMENT

Mathematics. Pre-algebra. Operations on numbers, their properties and their uses. The student shall be provided opportunities to solve simple equations involving integers, decimals and fractions.

NAME ______________________________ DATE ________________

Determining Total Calories



A SLICE OF BREAD CONTAINS:

1) 12.5 grams of carbohydrate X 4 (calories per gram) = ____ carbohydrate calories

2) 2.3 grams of protein X 4 (calories per gram) = ____ protein calories

3) .9 grams of fat X 9 (calories per gram) = ____ fat calories

4) Carbohydrate Calories ____

+ Protein Calories ____

+ Fat Calories ____

= TOTAL CALORIES ____

5) Percent of Calories from Fat ____

Determining Percent of Calories From Fat

To determine the percent of calories that come from fat for any given food, simply multiply the grams of fat by the calories per gram of fat and divide by the total calories in the food.

Example:

Two tablespoons of peanut butter contain 16 grams of fat and 200 total calories

16 (grams of fat) X 9 (calories per gram) = 144

200 (total calories)

144 ÷ 200 = 0.72 = 72%

Therefore, 72% of the calories in peanut butter came from fat.

Mathematics **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Compare the nutritive value of foods.

ASSESSMENT CRITERIA

Calculate the percentage of a variety of nutrients provided in food items.

ACTIVITIES & STRATEGIES

Discuss the following information with the students:

- The *RDA* is the Recommended Dietary Allowances for Americans. The RDA serves as a guideline for determining the amounts of nutrients suggested each day.
- The RDA gives the specific recommended daily nutrient needs for groups of people according to age and gender.
- Iron is a very important mineral. It helps make hemoglobin. A lack of iron will result in iron-deficiency anemia. Symptoms include pale skin, poor appetite, excessive tiredness, and weakness.
- Vitamin A helps eyes adjust to dim light and helps skin be healthy. It also helps promote growth and helps the body resist infection. A lack of vitamin A in the diet will result in the eyes becoming over-sensitive to light, night blindness, lowered resistance to infections, and the skin becoming rough and cracked.
- Proteins are needed for growing and forming new tissue; maintaining and repairing tissue; forming enzymes, hormones, and antibodies; providing energy; and regulating bodily processes.
- Vitamin C works with calcium to build and maintain healthy bones and teeth. It also keeps blood vessels strong and helps the body fight infection. Vitamin C deficiencies include bleeding gums, easy bruising, and a disease called *scurvy* if the vitamin is deficient over extended periods of time. Vitamin C helps the body absorb iron.

Distribute and review with the students the handouts, "Appendix D: Recommended Dietary Allowances" and "Appendix E: Food Composition Table," and the worksheet, "Nutrient Percents."

The handouts should be used to complete the worksheet. After completion, review the worksheet answers with the students.

RESOURCES & MATERIALS

Handout: "Appendix D: Recommended Dietary Allowances"

Handout: "Appendix E: Food Composition Table"

Worksheet: "Nutrient Percents"

ANSWER KEY

A. 1. a. 1. 7%
2. 5%
b. 1. 28%
2. 18%
2. a. 1. 29%
2. 19%
b. 1. 56%
2. 36%
3. The beef and vegetable stew contains the most iron.
4. The beef and vegetable stew contains the most protein.
B. 1. percentage of vitamin C
a. 177%
b. 206%
2. Percentage of vitamin C
a. 0%
b. 0%
c. The orange juice contains the most vitamin C.
C. If you know the recommended dietary allowence for a nutrient, you can make attempts to consume the right foods in the right amounts in order to avoid a deficiency in that nutrient.

ESSENTIAL ELEMENT

Mathematics. Pre-algebra. Experience in solving problems by selecting and matching strategies to given situations. The student shall be provided opportunities to find percent and percentage.

NAME ______________________________ DATE ______________

Nutrient Percents

A. Instructions: Using the Recommended Dietary Allowances, figure the percentage of iron and protein that the following foods provide for a 7-10 year-old child and a 15-18 year-old female. Figure the percentage by dividing the amount provided by the food by the amount required for one day. Place answers in the empty spaces.

1. Cheese pizza (1 slice)	1. Cheese pizza
a. Percentage of iron	a. Percentage of iron
1. For 7-10 year-old child	1.
2. For 15-18 year-old female	2.
b. Percentage of protein	b. Percentage of protein
1. For 7-10 year-old child	1.
2. For 15-18 year-old female	2.
2. Beef and vegetable stew (1 cup)	2. Beef and vegetable stew
a. Percentage of iron	a. Percentage of iron
1. For 7-10 year-old child	1.
2. For 15-18 year-old female	2.
b. Percentage of protein	b. Percentage of protein
1. For 7-10 year-old child	1.
2. For 15-18 year-old female	2.

3. Which food contains the most iron?

4. Which food contains the most protein?

B. Using the same charts, find the percentage of vitamin C that the following beverages provide for a pregnant woman and a 15-18 year-old male.

1. Orange juice, fresh (8 fluid ounces)	1. Orange juice
a. Percentage of vitamin C	a. Percentage of vitamin C
1. For pregnant woman	1.
2. For 15-18 year-old male	2.
2. Orange soda (12 fluid ounces)	2. Orange soda
a. Percentage of vitamin C	a. Percentage of vitamin C
1. For pregnant woman	1.
2. For 15-18 year-old male	2.

3. Which food contains the most vitamin C?

C. How can you use knowledge of the RDAs?

Mathematics High School

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Compare the nutritive value of food.

ASSESSMENT CRITERIA

Determine nutrient-rich foods based on the U.S. Recommended Daily Allowances.

ACTIVITIES & STRATEGIES

Define the United States Recommended Daily Allowances (U.S. RDA) and provide the following information for the class:

> The U.S. RDA was established in 1973 by the United States Food and Drug Administration to require food processors to include certain information on food labels. It is based on the Recommended Dietary Allowances and does not provide a different recommendation for each age/gender category like the RDA (Recommended Dietary Allowances).
>
> The U.S. RDA for adults used on food package labels are usually the highest of the regular RDA. For most nutrients, the U.S. RDA are the same as the RDA for an adult man. However, the women's RDA is used as the recommended amount for iron because a woman's need for iron is greater than a man's. A diet providing 100 percent of the U.S. RDA will meet and exceed the RDA for most of the nutrients and most people.

Using the U.S. RDA table and a food composition table, any food or meal may be evaluated to identify whether the food is a rich source of any nutrient. It is important for the students to understand that the recommendations for any nutrient may be achieved by consuming nutrient-rich foods or a combination of foods that are not individually nutrient-rich.

Write on the chalkboard the U.S. RDA chart found in the opposite column. Explain to the class that only selected nutrients are listed in this lesson. The students will need this chart of U.S. RDAs to complete the worksheet, "Identifying Nutrient-Rich Foods."

Distribute the worksheet, "Identifying Nutrient-Rich Foods." Review the procedure for determining nutrient-rich foods, using the example on the worksheet. Instruct the students to complete the worksheet. Then, review the answers with the class.

RESOURCES & MATERIALS

Worksheet: "Identifying Nutrient-Rich Foods"

Teacher Resource: Answer key for "Identifying Nutrient-Rich Foods"

U. S. Recommended Daily Allowances

Protein	45 g or 65 g (45 grams for foods from animal origin that contain high-quality protein or 65 grams for foods from plant origin that contain a lower quality protein)
Calcium	1000 mg
Iron	18 mg
Vitamin A	5000 International Units (IUs)
Thiamin	1.5 mg
Vitamin C	60 mg

TEACHER TIPS

- **U.S. RDA—Recommended Daily Allowances were designed to provide one recommended amount for each nutrient, not for each sex and age group.**
- **RDA—Recommended Dietary Allowances are daily recommended intakes of nutrients intended to provide for individual variations among most normal, healthy people in the U.S.**
- **A food that supplies 20 percent of the U.S. RDA is considered to be a nutrient-rich food.**

ESSENTIAL ELEMENT

Mathematics. Pre-algebra. Experience in solving problems by selecting and matching strategies to given situations. The student shall be provided opportunities to use ratio and proportion and find percent and percentage.

NAME ____________

Identifying Nutrient-Rich Foods

1. Using the U. S. RDA values and the nutrient contributions to identify the foods that are rich sources of each of the nutrients listed. Round each number to the nearest percent.

Example: **a. Broccoli:**

1/2 cup of broccoli supplies 2.3 g of protein and the U.S. RDA for protein from a plant source is 65 g

$$x = \frac{2.3\text{ g}}{65\text{ g}} \times 100 \text{ percent}$$

x = 0.035 X 100 percent

x = 4 percent (3.5 rounded to the nearest percentage)

Food Item	Protein	% of U.S.RDA	Iron	% of U.S.RDA	Calcium	% of U.S.RDA	Vitamin A (Retinol)	% of U.S.RDA	Vitamin B_1 (Thiamin)	% of U.S.RDA	Vitamin C (Ascorbic Acid)	% of U.S.RDA
a. Broccoli 1/2 cup	2.3 g	4 %	.56 mg		89 mg		1099 IU		.06 mg		49 mg	
b. Chicken roasted w/o skin 3.5 oz.	30.9		1.06 mg		15 mg		29 IU		.07 mg		0 mg	
c. Cola 12 fl. oz.	.1 g		.13 mg		9 mg		0		0 mg		0 mg	
d. Milk 8 fl. oz.	8.1 g		.12 mg		297 mg		500 IU		.10 mg		2 mg	
e. Oatmeal, instant 1 pkg.	44 g		6.32 mg		163 mg		1514 IU		.53 mg		0 mg	
f. Orange juice 6 fl. oz.	1.3 g		.18 mg		16 mg		146 IU		.15 mg		73 mg	
g. Tortilla chips 1 oz.	2 g		0		0 mg		0		0 mg		0 mg	

2. Using the percentage calculations from the chart above, name the rich food sources for each of the following nutrients:

a. Protein

b. Calcium

c. Iron

d. Vitamin A

e. Thiamin

f. Vitamin C

3. Some foods may be rich sources of more than one nutrient. List the food(s) from the chart above that are rich sources of more than one nutrient. List the nutrients next to each food.

4. List the foods that are NOT rich sources of any of the nutrients.

5. If your diet primarily consisted of foods that contained little or no nutrients, what would be the long-term effects on your health?

DATE ____________

TEXAS EDUCATION AGENCY
ESR IV

Identifying Nutrient-Rich Foods

1. Using the U. S. RDA values and the nutrient contributions to identify the foods that are rich sources of each of the nutrients listed. Round each number to the nearest percent.

Example: **a. Broccoli:**

1/2 cup of broccoli supplies 2.3 g of protein and the U.S. RDA for protein from a plant source is 65 g

$$x = \frac{2.3\text{ g}}{65\text{ g}} \text{ X } 100 \text{ percent}$$

x = 0.035 X 100 percent

x = 4 percent (3.5 rounded to the nearest percentage)

Food Item	Protein	% of U.S.RDA	Iron	% of U.S.RDA	Calcium	% of U.S.RDA	Vitamin A (Retinol)	% of U.S.RDA	Vitamin B_1 (Thiamin)	% of U.S.RDA	Vitamin C (Ascorbic Acid)	% of U.S.RDA
a. Broccoli 1/2 cup	2.3 g	4 %	.56 mg	3 %	89 mg	9 %	1099 IU	22 %	.06 mg	4 %	49 mg	82%
b. Chicken roasted w/o skin 3.5 oz.	30.9	69	1.06 mg	6	15 mg	2	29 IU	.6	.07 mg	5	0 mg	0
c. Cola 12 fl. oz.	.1 g	.2	.13 mg	.7	9 mg	.9	0	0	0 mg	0	0 mg	0
d. Milk 8 fl. oz.	8.1 g	18	.12 mg	.7	297 mg	30	500 IU	10	.10 mg	7	2 mg	3
e. Oatmeal, instant 1 pkg.	44 g	68	6.32 mg	35	163 mg	16	1514 IU	30	.53 mg	35	0 mg	0
f. Orange juice 6 fl. oz.	1.3 g	2	.18 mg	1	16 mg	2	146 IU	3	.15 mg	10	73 mg	122%
g. Tortilla chips 1 oz.	2 g	3%	0	0	0 mg	0	0	0	0 mg	0	0 mg	0

Answer Key

2. Using the percentage calculations from the chart above, name the rich food sources for each of the following nutrients:

a. Protein—*chicken, oatmeal*

b. Calcium—*milk*

c. Iron—*oatmeal*

d. Vitamin A—*broccoli, oatmeal*

e. Thiamin—*oatmeal*

f. Vitamin C—*broccoli, orange juice*

3. Some foods may be rich sources of more than one nutrient. List the food(s) from the chart above that are rich sources of more than one nutrient. List the nutrients next to each food. *broccoli–vitamin A, vitamin C*
oatmeal–iron, vitamin A, thiamin, protein

4. List the foods that are NOT rich sources of any of the nutrients. *cola, tortilla chips*

5. If your diet primarily consisted of foods that contained little or no nutrients, what would be the long-term effects on your health?

LESSON OBJECTIVE

Analyze the relationship between nutrition, health, and wellness.

ASSESSMENT CRITERIA

Identify the nutrients consumed in one day and the effects on health and wellness.

Mathematics **High School**

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Present this case study to the class:

Mary and Jenny are sisters. Both are high school students. Jenny, age 18, is a senior in high school, and Mary, age 16, is a sophomore. They are very active in school functions and community activities.

They need to make good grades in order to participate in band and basketball. They average approximately 4 to 5 hours of sleep a night; consequently, they do not get out of bed in time to eat a good breakfast.

Jenny was sick and missed 2 days of school last week. Mary is catching a cold. They each missed 5 days of school during the first six weeks, and now it is the beginning of the second six weeks of school.

Instruct the students to complete the following activities:

- Use "Appendix D: Recommended Dietary Allowances," and determine the daily allowances recommended for Mary and for Jenny.
- Use "Appendix E: Food Composition Table" to prepare a chart and compute the nutrients received from the food eaten.
- Compare the 2 charts and draw some conclusions concerning the nutrients which they lack.
- Compare the menus with the food groups and servings in "Appendix C: A Pattern for Daily Food Choices."
- Draw conclusions as to why Mary and Jenny are sick. How does good nutrition affect students' attendance in school, their grades, and how they get along with other people?

Tell students to write a summary of their conclusions to the above comparisons. Include the changes or improvements that need to be made in their diets and justify your answers.

RESOURCES & MATERIALS

"Appendix D: Recommended Dietary Allowances"

"Appendix E: Food Composition Table"

"Appendix C: A Pattern for Daily Food Choices"

The sisters' food selections for a day:

Breakfast (on the run)
Orange juice - 1 1/2 cups

Lunch (at a pizza restaurant)
Pepperoni pizza - 2 slices
Cola drink - 1 with 2 refills

Supper (eaten at home)
Broiled chicken - 1 piece
Mashed potatoes - 1/2 cup
Buttered broccoli - 1/2 cup
1 teaspoon margarine
Iced tea

ESSENTIAL ELEMENT

Mathematics of money. Problem solving/decision making. The student shall be provided opportunities to reflect on the problem-solution process and the solution of a problem by evaluating outcomes for reasonableness (including appropriateness of units), making revisions as needed, describing and discussing the process and solution, and making a decision based on the solution.

Mathematics **High School**

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Analyze the relationship between nutrition, health, and wellness.

ASSESSMENT CRITERIA

Identify the nutrients consumed in one day and the effects on health and wellness.

ACTIVITIES & STRATEGIES

Present this case study to the class:

> Jesse and Karen Lopez are a young married couple. Jesse, age 22, is an insurance salesman. He was an athlete in high school, but his activity level has decreased. He finds himself spending most of his time in his car or with his clients. He has gained weight and would like to lose about 15 pounds. Karen, age 20, is a college senior. Her classes keep her very busy and she has no trouble keeping her ideal weight. Karen and Jesse, because of their sex and ages, need different amounts of calories and nutrients.

On the chalkboard, copy food selections for one day from the menu in the opposite column.

Instruct the students to complete the following activities:

- Use "Appendix D: Recommended Dietary Allowances" to determine the daily allowances recommended for Karen and for Jesse, using a chart form.
- Use "Appendix E: Food Composition Table" to prepare a chart to compute the nutrients received from the food eaten in one day.
- Compare the two charts and draw some conclusions concerning the nutrients which they lack.
- Compare the menus with the food groups and servings in "Appendix C: A Pattern for Daily Food Choices." Were a sufficient number of servings included from each group?
- How could this menu be adjusted to reduce calories? (Cut down on butter, change to 1% milk, and eliminate bacon and dessert.)
- Summarize in writing your conclusions to the above comparisons and questions. Would you make any changes or improvements in their diets? Justify your decisions.

RESOURCES & MATERIALS

"Appendix D: Recommended Dietary Allowances"

"Appendix E: Food Composition Table"

"Appendix C: A Pattern for Daily Food Choices"

The Lopez's food selections for a day:

Breakfast:
- Orange juice - 1 cup
- Bacon (microwave) - 1 piece
- Oatmeal with - 1/3 cup uncooked
- Butter, sugar - 2 teaspoons each and milk - 1/4 cup
- Buttered toast - 1 slice whole wheat bread
- 1 teaspoon margarine

Jesse's Lunch
- Pork chops - 1 medium
- Buttered carrots - 1/2 cup (1 teaspoon margarine)
- Green beans - 1/2 cup
- Hot rolls - 2
- Pear half and brownie - 1
- Iced tea

Karen's Lunch
- Turkey sandwich (mayonnaise, lettuce, tomato)
- Chips
- Iced tea

Supper
- Broiled chicken breast - 1 piece
- Lettuce salad - 1 cup
- Chocolate cake - 1/16 of cake
- Ice cream - 1/2 cup
- Whole milk - 2 cups

ESSENTIAL ELEMENT

Mathematics. Mathematics of money. Problem solving/decision making. The student shall be provided opportunities to reflect on the problem-solution process and the solution of a problem by evaluating outcomes for reasonableness (including appropriateness of units), making revisions as needed, describing and discussing the process and solution, and making a decision based on the solution.

LESSON OBJECTIVE

Analyze the relationship between nutrition, health, and wellness.

ASSESSMENT CRITERIA

Compare foods to determine their nutrient density.

Mathematics **High School**

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Define nutrient density. ***Nutrient density*** refers to the amount of nutrients compared to calories (energy) found in a food. Foods such as vitamin-rich fruits and vegetables, low-fat milk, and whole-grain enriched breads and cereals are considered nutrient-dense foods. Foods such as soft drinks, candy, cakes, and cookies generally have a low nutrient density.

One can evaluate the nutrient density of foods by comparing the nutrient composition with the total caloric content.

Ask students to use "Appendix E: Food Composition Table" to complete the worksheet, "Nutrient Density." Students will compare the nutrient density of 10 different foods.

Tell students to compare and evaluate their favorite foods from "Appendix E: Food Composition Table."

Points for discussion include:
- Nutrient density is a quick way to help you choose foods that provide necessary nutrients, but fewer calories.
- Nutrient-dense foods are the best way to provide good health and wellness for yourself and your family.
- Wise consumers choose nutrient-dense foods over expensive vitamin supplements. Nutrient-dense foods provide good nutrition and are much less expensive than vitamin and mineral supplements.

After students have completed the chart and evaluated the foods, tell them to complete the second part of the worksheet. Ask volunteers to read their meal plans to promote class discussion.

RESOURCES & MATERIALS

Worksheet: "Nutrient Density"

"Appendix E: Food Composition Table"

"Appendix C: A Pattern for Daily Food Choices"

TEACHER TIP

Remind students that they can still eat their favorite foods, even low nutrient-dense foods, if they are balanced by nutrient-dense foods and fit into the needed calorie intake.

ESSENTIAL ELEMENT

Mathematics. Fundamental of mathematics. The use of probability and statistics to collect and interpret data. The student shall be provided opportunities to construct charts, graphs, and frequency tables from given data.

NAME ______________________________ DATE ________________

Nutrient Density

Nutrient density refers to the amount of nutrients compared to calories (energy) found in a food. Foods that have a high ratio of nutrients to calories are called nutrient-dense foods. Foods such as vitamin-rich fruits and vegetables, milk, whole-grain enriched breads and cereals are considered nutrient-dense foods. Foods such as soft drinks, candy, cakes, and cookies have a low nutrient density.

I. Use "Appendix E: Food Composition Table" to compare the nutrient density of the following foods.

	Broccoli	Candy bar	Fruit wrinkles	Fresh fruit	Oatmeal	Ready-to-eat cereal	Orange juice	Cola
Serving size								
Calories								
Carbohydrates								
Percentage of U.S. RDA								
Protein								
Vitamin A								
Vitamin C								
Thiamin								
Riboflavin								
Niacin								
Iron								
Sodium								
Calcium								

II. In the space below, plan a day's meals that include nutrient-dense foods. Use "Appendix C: A Pattern for Daily Food Choices" to assist you in planning your meals. Be sure to include foods from all food groups and the recommended servings from each group.

LESSON OBJECTIVE

Examine ways to reduce intake of cholesterol.

ASSESSMENT CRITERIA

Interpret graphs to rank common oils.

Mathematics **High School**

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Discuss the following information regarding cholesterol and fat in the diet.

- ***Saturated fats*** are found in animal fats such as meat and dairy products and in plant oils such as coconut oil and palm oil. Dietary cholesterol is found only in animal foods, and they are the major source of fat in the American diet. Large amounts of data support the premise that a high intake of saturated fat raises blood cholesterol levels and increases the risk of heart disease. Saturated fats are usually solid at room temperature. By using a process called hydrogenation, food manufacturers can change polyunsaturated vegetable oils into saturated vegetable oils. Hydrogenation is the process of adding hydrogen to unsaturated fat to make it more solid and resistant to chemical change (shortening, margarine). Saturated fats should contribute no more than 10 percent of the daily caloric intake.
- ***Polyunsaturated fats*** come from vegetable oils and fish oils. Our bodies can synthesize saturated fatty acids, but not all polyunsaturated fatty acids. This is the reason that we must consume polyunsaturated fatty acids in our diets. They perform a variety of body functions necessary to the proper functioning of the nervous, digestive, and reproductive systems. Polyunsaturated fat may help lower the level of blood cholesterol.
- ***Monounsaturated fats*** can be found in avocados, peanut oil, canola oil, and olive oil. They may be more effective than polyunsaturated oils in decreasing blood cholesterol.

Distribute and review the worksheet, "Fat Pie Chart: The Composition of Fats," with the students. Review the answers after completion.

RESOURCES & MATERIALS

Worksheet: "Fat Pie Chart: The Composition of Fats"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

"Heart Challenges," American Heart Association Schoolsite Program, High School

ANSWER KEY

A.
1. **safflower**
2. **corn**
3. **olive**
4. **peanut**
5. **cottonseed**
6. **palm**
7. **coconut**

B.
1. **It is lowest in saturated fat.**
2. **Polyunsaturated fat and monounsaturated fat may help lower the level of blood cholesterol.**

TEACHER TIP

Stress that saturated fat and cholesterol are not the same thing. Saturated fat contains cholesterol.

ESSENTIAL ELEMENT

Mathematics. Pre-algebra. Probability, statistics, and graphing. Use of probability and statistics to collect and interpret data. The student shall be provided opportunities to interpret graphs and analyze data to solve relevant problems.

NAME ______________________________ **DATE** ________________

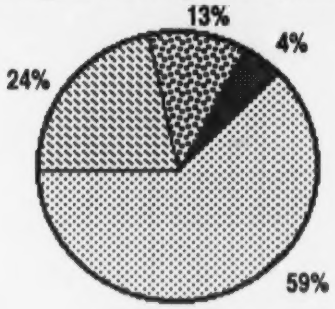
Fat Pie Chart: The Composition of Fats

The chemical structure of fats varies. The more hydrogen the fat contains, the more saturated it is. Findings suggest that a high intake of saturated fat raises blood cholesterol levels and increases the risk of heart disease. Examples of foods with saturated fats are beef, pork, lamb, butter, lard, tropical oils, sour cream, ice cream, whole milk products, high-fat cheeses, bacon, some luncheon meats, cakes, pastries, and hydrogenated shortening.

A. Interpret the information found on the following pie charts. By placing numbers in the blanks below each oil name, rank the fats represented on the pie charts, from the one with the least amount of saturated fat to the one with the most.

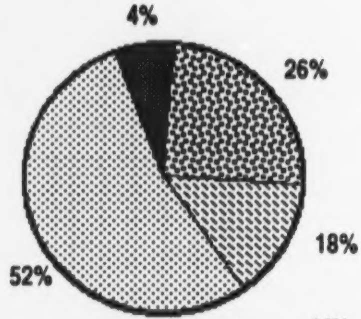
B. 1. If you were interested in reducing the amount of cholesterol in your diet, what would be the benefit of choosing the oil ranked first, i.e., the oil with the least amount of saturated fat?

2. What is the advantage of choosing foods containing polyunsaturated fat or monounsaturated fat?



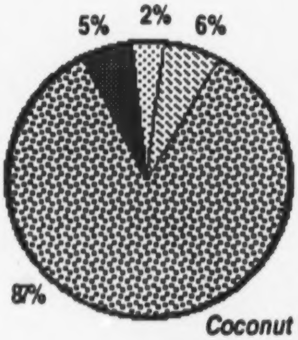
Corn Oil

____



Cottonseed Oil

____



Coconut Oil

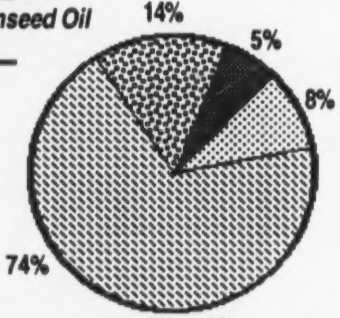
____

■ *Other Substances*

▨ *Polyunsaturated*

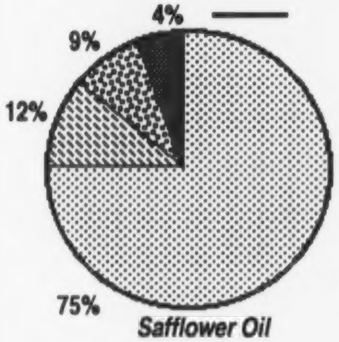
▨ *Monounsaturated*

▨ *Saturated*



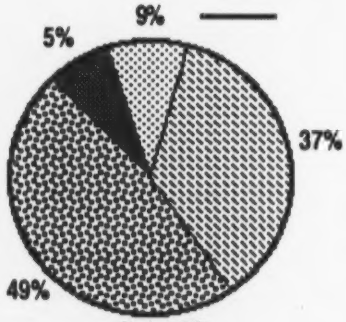
Olive Oil

____



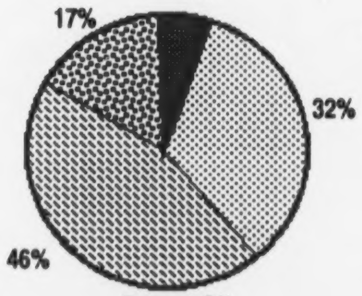
Safflower Oil

____



Palm Oil

____



Peanut Oil

____

LESSON OBJECTIVE

List strategies for reducing the amount of sugar in the diet.

ASSESSMENT CRITERIA

Analyze the terms used for sugar and the method of preparation to determine hidden sugar.

ACTIVITIES & STRATEGIES

Review the following terms for different types of sugar. Any of them could be seen on food labels.

brown sugar
confectioner's sugar
corn sweeteners
corn syrup
dextrose
fructose
glucose
granulated sugar
high-fructose corn sweeteners
honey
invert sugar
lactose
maltose
maple sugar
molasses
raw sugar
sucrose

Distribute and review the worksheet, "Menu Modification," with the students. Remind them to consider the method of preparation of the food. (Is it candied or glazed?)

Ask the students to share their revised menus with the class.

Extension:
Bring some food labels to class that are examples of how food can have sugar listed several times and in different forms. Let students observe and discuss how much sugar might be in those foods.

Mathematics **High School**

HS

TEXAS EDUCATION AGENCY

RESOURCES & MATERIALS

Worksheet: "Menu Modification"

"Appendix E: Food Composition Table"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

ANSWER KEY

This is a possible revision of the menu with food items found in "Appendix E: Food Composition Table." There will be many answers.

Morning
- **Fresh peach**
- **Oatmeal**
- **Butter, sugar, milk**
- **Whole wheat toast**
- **Milk**

Midday
- **Chicken sandwich on**
- **Whole wheat bread**
- **Lettuce and tomato on sandwich**
- **Angel food cake with strawberries**

Evening
- **Baked ham**
- **Steamed broccoli**
- **Baked potato**
- **Tossed salad**
- **Hard roll**
- **Fresh fruit**

Snack
- **Popcorn (not buttered)**
- **Fruit juice**

ESSENTIAL ELEMENT

Mathematics. Fundamentals of mathematics. Concepts and skills associated with the understanding of numbers (whole, integer, and rational) and the place-value system. The student shall be provided opportunities to use the operations of addition, subtraction, multiplication, and division with whole numbers and integers in practical situations.

NAME ______________________________ **DATE** ________________

Menu Modification

Directions:

Total the number of calories in the left hand column. For each menu item **not** bolded on the chart, suggest in the spaces below another food to replace it. Use changes that would lower the sugar content. Suggest different foods or different preparation methods as you replace the menu words that are not bolded.

Use "Appendix E: Food Composition Table" to find the calorie content of the foods in the revised menu. Write the total number of calories for each meal in the boxes on your revised menu.

Remember:

Moderate

your

sugar

intake!

Meal	*Calories*	*Menu*
Morning	190	Peach slices in heavy syrup
	121	Presweetened cereal
	161	Coffeecake
	158	Chocolate milk
Midday	264	Peanut butter and jelly sandwich
	148	Potato chips
	233	Chocolate cake
	155	Cola drink
Evening	195	Glazed ham
	23	**Steamed broccoli**
	143	Candied sweet potatoes
	126	Strawberry gelatin salad
	100	**Hard roll**
	282	Apple pie
Snack	134	Caramel popcorn
	118	Fruit-flavored punch
Total		

Revised Menu:

Morning

Total calories

Midday

Total calories

Evening

Total calories

Snack

Total calories

Mathematics **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

List strategies for reducing the amount of sugar in the diet.

ASSESSMENT CRITERIA

Analyze the effect of eating too much sugar.

ACTIVITIES & STRATEGIES

The average American consumes an estimated 60 to 80 pounds of sugar a year which is approximately one-fourth pound of sugar per person per day.

It is recommended that people reduce their sugar intake to only 10 percent of total calories and increase their complex carbohydrate intake to 50 percent of all calories.

Distribute the worksheet, "A Carbohydrate Search," to the students. Discuss the definitions of *simple carbohydrates* and *complex carbohydrates.*

Carbohydrates provide the most readily available source of energy to the body. They are divided into two categories, simple and complex.

- ***Simple carbohydrates*** are sugars and need little or no change during digestion. These should make up no more than 10 percent of total daily calories.
- ***Complex carbohydrates*** include starches and fiber. These should make up 50 to 60 percent of a day's calorie intake and are found in vegetables, grains, legumes, and fruits.

Analyze the charts of simple carbohydrates and complex carbohydrates found on the worksheet, "A Carbohydrate Search." Assign students to complete the activity and questions on the worksheet.

Tell students to determine how many grams of carbohydrates should be included in their daily diets if 50 percent of total daily calories should come from complex carbohydrates.

Additional information:

- The average calorie intake is:
  - 3000 calories for an active teenager
  - 2000 calories for a teenager with an average lifestyle
- One gram of carbohydrate yields four calories.

RESOURCES & MATERIALS

Worksheet: "A Carbohydrate Search"

Handout: "Appendix E: Food Composition Table"

School lunch menu

Answer Key

1. **Answers will vary.**
2. **Total the complex carbohydrates in question #1; divide the total by 3000.**
3. **Answers will vary, but consider: more foods are simple carbohydrates; not enough fruits and vegetables were eaten; did not eat three meals, only snacks.**
4. **Divide total number of carbohydrates by 2500.**
5. **Answers could be: to eat three balanced meals a day and to get more rest and exercise.**

Obtain a school lunch menu from the cafeteria manager.

ESSENTIAL ELEMENT

Mathematics. Algebra I. Comparison of the real number system and its various subsystems in terms of structural characteristics including operations. The student shall be provided opportunities to identify and use properties of the real numbers.

NAME ______________________________ **DATE** ____________________

A Carbohydrate Search

- Carbohydrates are nutrients that supply energy for body functions.
- Carbohydrates are broken down in the body into sugars, starches, and fiber.
- Sugars are known as ***simple carbohydrates***.
- Starches and fibers are known as ***complex carbohydrates.***

Analyze the foods listed in the charts below and answer the questions on a sheet of notebook paper.

Simple Carbohydrates

FOOD ITEM	AMOUNT EATEN	CALORIES
homemade chocolate cake with chocolate frosting	1 piece, 1/12 of cake	233
milk chocolate candy bar	1 - 1.65 ounces	254
chocolate candy bar with peanuts	1 - 1.65 ounces	296
cherry pie (homemade)	1/8 of pie	308
dried fruit (apricots)	10 halves	83
jams	1 tablespoon	54
jellies	1 tablespoon	49
sugar	1 tablespoon	46
syrup	1 tablespoon	50

Complex Carbohydrates

FOOD ITEM	AMOUNT EATEN	CALORIES
whole wheat bread	1 slice	60
oatmeal, cooked	1 cup	144
rice	1 cup	186
spaghetti and meat sauce	1 cup	204
kidney beans	1/2 cup	110
green peas	1/2 cup	55
baked potato	1 medium	95
corn	1/2 cup	70
broccoli spears	1 spear	42
air-popped popcorn	l cup	25

Questions

1. Use "Appendix E: Food Composition Table," and the above charts to review a day's school lunch menu. Record the number of calories for each serving of a complex carbohydrate food.
2. Determine the percent of calories from complex carbohydrates for the full day's meals. Use 3000 calories as the average number of calories consumed by teenagers.
3. What conclusions can you draw from what you have learned about carbohydrates and the menus that you have evaluated?
4. If the average adult's calorie need is approximately 2500 calories per day, what percentage of total calories would the carbohydrate foods on your menu provide?
5. What other changes would help improve your overall nutritional health?

Mathematics **High School**

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

List strategies for reducing the amount of sugar in the diet.

ASSESSMENT CRITERIA

Compare calories in a food prepared in various ways.

ACTIVITIES & STRATEGIES

Present the following case study to the class:

> Sally was preparing two Dutch apple pies. The telephone rang and she tried to talk and prepare the topping at the same time. She soon realized that she had measured incorrectly and added I cup margarine rather than 1/3 cup to the required amounts of flour and sugar.

Topping recipe:
Cut with a pastry cutter or two knives:
3/4 cup flour
1 cup sugar
1/3 cup margarine
Place over apple filling in unbaked pie crust.
Bake as directed.

What amounts of sugar and flour should be included to achieve the correct proportions of these ingredients? By correcting the mistake, the extra topping could be stored in the refrigerator for later use on other pies or desserts.

Discuss ways in which Sally could serve apples to her family that would be more nutritious and contain less sugar than the apple pies.

Discuss the calories of these different foods.

RESOURCES & MATERIALS

ANSWER KEY

Recipe problem: Sally added 3 times the amount of butter needed, so she must add three times the other ingredients: I cup sugar x 3 = 3 cups; 3/4 cup flour x 3 = 2 1/4 cups. She has already added I cup sugar and 3/4 cup of sugar; she must add the additional 2 cups of sugar and 1 1/2 cup of flour to the mixture.

Methods of serving apples and number of calories:

- **Apple pie, homemade (1/8 pie) - 282 calories**
- **Fresh apple - 81 calories**
- **Baked apple with 2 teaspoons each, of margarine and brown sugar, and cinnamon to taste - 137 calories**
- **Stewed apple, (1 cup) - 91 calories**
- **Applesauce, canned, unsweetened (1/2 cup) - 97 calories**

An advantage of eating apples prepared by other methods: less fat and sugar in the diet. This could help to prevent being overweight and possibly prevent heart disease, diabetes, and certain types of cancer in the future.

ESSENTIAL ELEMENT

Mathematics. Fundamentals of mathematics. Concepts and skills associated with the understanding of numbers (whole, integer, and rational) and the place-value system. The student shall be provided opportunities to use the operations of addition, subtraction, multiplication, and division with fractions in problem situations.

Mathematics **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Determine the relationship between nutrition and weight control.

ASSESSMENT CRITERIA

- Calculate individual energy requirements.
- Determine the effects of consuming more calories than needed.

ACTIVITIES & STRATEGIES

Discuss the following information with the students:

- ***Basal metabolism*** is the amount of energy your body needs to maintain basic processes at rest.
- Breathing, circulating blood, and building and repairing tissues are included in these processes.
- Everyone has their own B.M.R., or basal metabolic rate, because each individual body works at its own speed. Energy needs vary from person to person.
- The body needs energy for other activities as well as metabolism. The type of activity and its duration determines the amount of energy needed. An evening of ice skating would use more energy than an evening of watching television.
- ***Thermic effect*** of food is the amount of energy used by the body during digestion and absorption of nutrients from food.
- Food consumed and not used for energy will be stored in the body as fat, and weight will be gained. The opposite is true when not enough food is consumed to meet the energy requirements of the body.
- A ***calorie*** is the unit used to express food's energy value.
- Strict dieting can cause a loss of muscle tissue. It can also lower the metabolism which can result in a regain of weight with a higher percentage of body fat when normal eating habits are resumed.
- Muscles are metabolically more active; therefore the more muscular body will have a higher basal metabolic rate.

Distribute and review the worksheet, "How Much Should I Eat?" with the students.

Discuss the answers with the class after completion.

RESOURCES & MATERIALS

Worksheet: "How Much Should I Eat?"

ANSWER KEY

Part A. Students' answers will vary.
Part B. 15 pounds

TEACHER TIP

Avoid judgmental statements about people who are either overweight or underweight.

ESSENTIAL ELEMENTS

Mathematics. Pre-algebra. Operations on numbers, their properties, and their uses. The student shall be provided opportunities to understand basic operations with and properties of integers, decimals, and fractions.
Mathematics. Pre-algebra. Experience in solving problems by selecting and matching strategies to given situations. The student shall be provided opportunities to find percent and percentage.

NAME ______________________________ DATE ______________

HOW MUCH SHOULD I EAT?

A. Instructions: Use the following calculation to figure approximately how many calories your body requires to maintain its present weight:

1. Find your weight in kilograms by dividing your weight in pounds by 2.2.

2. Estimate your basal energy needs: If you are a female, multiply your weight in kilograms by 22. If you are a male, multiply your weight in kilograms by 24.

3. Estimate the percent of basal calories required for your usual activity level by calculating a percentage of your basal energy needs (figured in #2.) Add those two numbers together. The activity levels are as follows: very sedentary, 20%; sedentary, 30%; moderately active, 40%; very active, 50%. For example:

    a. 1340 (basal energy needs) x 30% = 402
    b. 402 + 1340 = 1742

4. Add 10 percent more required calories for thermic effect of food (energy expended to digest and absorb nutrients from food.) For example:

    a. 1742 x 10% = 174 (rounded to the nearest whole number)
    b. 1742 + 174 = 1916 (total daily energy needs)

5. What is your total daily energy need?

B. If you exceeded your energy needs every day of the year by drinking one soft drink, how many pounds would you gain? The soft drink you consumed had 160 calories in 12 fluid ounces. The amount of calories it takes to gain one pound is 3500. Remember to account for the thermic effect of food by multiplying your answer by 10 percent and subtracting that number from the total. Round your answer to the nearest whole number.

Mathematics **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Analyze the economics of good nutrition.

ASSESSMENT CRITERIA

Evaluate the cost of several fast food meals with the cost of food in the school cafeteria.

ACTIVITIES & STRATEGIES

Discuss the information on the transparency, "Appendix F: Dietary Guidelines for Americans." Point out the following facts:

- Fast food meals often do not include a variety of foods. They are deficient when it comes to fruits, vegetables, whole grains, and low-fat diary products.
- Fast food meals are usually high in fat. The typical fast food meal may derive as much as 55 percent of its total calories from fat. This fat often contains cholesterol and is saturated.
- Soft drinks and shakes contain high amounts of sugar. It is suggested that other beverage choices such as low-fat milk or juice, replace the high-sugar options.
- Sodium is used liberally at a fast food restaurant. Foods like french fries, onion rings, catsup, salad dressings, and some sandwiches usually contain high amounts of salt.
- Even though fast food is often the least expensive of restaurant choices, it is still more expensive than the foods sold by the school cafeteria.
- Foods provided by the school cafeteria are balanced, nutritious, and cost effective.

Distribute the worksheet, "The Cost of a Good Meal." Ask students to recall average prices for the described food items sold at fast food restaurants. Write down the consensus.

Using a menu from the school cafeteria, ask students to recall the price for a full meal that includes one serving of milk. This meal should be from the menu for today or a recent school lunch menu. Instruct students to calculate the cost of the meals in relation to one another, and then rank them in order from lowest price to highest price.

Display the transparency because the students will need to look at the information on "Appendix F: Dietary Guidelines for Americans" in order to answer some questions on the worksheet.

RESOURCES & MATERIALS

Transparency: "Appendix F: Dietary Guidelines for Americans"

Worksheet: "The Cost of a Good Meal"

School lunch menu for the day

"Heart Challenges," American Heart Association Schoolsite Program, High School

ANSWER KEY

- **Prices will vary for fast food and the school lunch. Due to price variations, #s 1 and 2 will be dependent on class input.**
- **3. Food served in the school cafeteria often costs less than food served at fast food restaurants. It is often a healthier choice because school food service serves meals that are balanced and nutritious. Fast food meals are usually high in sodium, fat, and sugar, and do not provide the variety of nutrients that the body needs to stay healthy.**
- **Bonus questions: Students may help their friend meet the goal of staying healthy by describing several of the guidelines found on "Appendix F: Dietary Guidelines for Americans." Students should apply three of the guidelines to themselves and describe why they are concerned that they are not following these three guidelines.**

Obtain a school lunch menu from the cafeteria manager.

ESSENTIAL ELEMENT

Mathematics. Fundamentals of mathematics. Concepts and skills involving income, cost comparisons, and taxes. The student shall be provided opportunities to apply percents.

NAME ______________________________ **DATE** ____________________

The Cost of a Good Meal

Instructions: As a class, decide the cost of two fast food meals. Compare that cost with what you might pay for a meal in the school cafeteria.

Meal choices	***Cost of each item***	***Total cost***
Fast food meal #1		
Cheeseburger	____________	____________
Large french fries	____________	
Milkshake	____________	
Box of cookies	____________	
Fast food meal #2		
Fish sandwich	____________	____________
Large onion rings	____________	
Large cola	____________	
Ice cream sundae	____________	
School cafeteria meal (Write the menu for today, including a serving of milk.)		____________
____________	____________	
____________	____________	
____________	____________	
____________	____________	
____________	____________	

1. Compare the cost of the meals by dividing each of the lower priced meals by the cost of the higher priced meal. Make sure you represent your answer in percentage form by moving the decimal two spaces to the right. This will give you a cost comparison that describes the percentage of money you would spend on the lower priced meal in relation to the highest priced meal.

2. Rank the meals from lowest to highest, according to price percentages. (The highest priced meal should be 100%.)

3. What might be some advantages of eating in the school cafeteria rather than eating in a fast food restaurant?

Bonus questions:

Your friend is very concerned about health, but is unaware of the connection between eating nutritious food and staying well. Your friend often chooses fast food for lunch instead of food in the school cafeteria.

- What guidelines would you suggest if you wanted to help your friend meet the goal of healthful eating?
- What three guidelines concern you most about your own eating habits?
- Why?
- What are fast food restaurants doing to appeal to the health-conscious consumer?

LESSON OBJECTIVE

Analyze the economics of good nutrition.

ASSESSMENT CRITERIA

Develop a budget for planning low-fat, high-fiber meals.

ACTIVITIES & STRATEGIES

Case study:

Kyle and Flo have three children. Kyle is a mechanic for an automobile company, and Flo is a sales clerk in a department store. One child is in elementary school, and two are in junior high school. Kyle and Flo's combined net salary is $22,000. Kyle has a heart problem, and his medicine is approximately $150 a month of which insurance pays 80 percent.

Due to Kyle's heart condition, Flo and Kyle must plan low-fat meals using monounsaturated or polyunsaturated oils and margarine and lean meats, such as chicken and fish. He must avoid fried foods, lunch meats, coconut oils, palm oils, and whole milk. Kyle needs a high-fiber diet, so Flo must include whole-grain breads and cereals as well as fresh fruits and vegetables.

Plan a yearly and monthly budget for the family using the percentages listed in the next column.

Consult "Appendix C: A Pattern for Daily Food Choices" as you plan the meals. Include each group and the correct number of servings for each group. Show your calculations.

Study the grocery advertisements from local food stores.
- Plan a day's menu (breakfast, lunch, supper, and snacks.)
- Calculate the cost of the food for the day's meals.
- Estimate the amount which would be spent monthly, using the cost of the day's meals.
- If each day's meals cost approximately the same, calculate to see if you would be within the monthly food budget.

RESOURCES & MATERIALS

"Appendix C: A Pattern for Daily Food Choices"

Grocery advertisements from local stores

Materials on low-budget meals and budgets available from the Texas Agricultural Extension Service

Percentages for a budget:
- Housing, includes mortgage or rent, taxes, insurance, and utilities—25 to 30%
- Food, includes eating out—15 to 20%
- Debt payments, includes car, loans, and credit card payments—15 to 20%
- Clothing—10%
- Transportation, includes gas, insurance, and repair costs—5 to 10%
- Savings—10%
- Miscellaneous, includes entertainment, medical insurance and expenses, education costs, personal grooming supplies, recreation, and charitable contributions—10 to 20%

TEACHER TIP

If the social studies department uses the daily newspaper in their classes, ask them to save the grocery advertisements for you.

ESSENTIAL ELEMENT

Mathematics. Mathematics of money. Spending money. The student shall be provided opportunities to create budgets from a simple personal budget to that of a small business, using a spreadsheet where appropriate.

LESSON OBJECTIVE

Identify nutrients, their sources, and their functions.

ASSESSMENT CRITERIA

Assess the body's need for calcium and the effect of calcium deficiency on bone density.

ACTIVITIES & STRATEGIES

Discuss with the students the following information about calcium, taken from the "Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*:

- Calcium is a ***macromineral***, a mineral found in large amounts in the body.
- Calcium is needed for bone density, blood clotting, muscle contraction, and normal nerve functions.
- Foods which are rich in calcium include milk and milk products, leafy green vegetables (spinach), broccoli, and soft-boned fish (canned sardines with bones).

Illustrate how much calcium is in the human body at differing ages with "calcium bags." Use three plastic bags and fill them with the amount of flour specified in the next column. This is a visualizing activity; flour does not contain calcuim.

Conduct a demonstration to show a bone that has had the calcium removed. Clean a chicken bone of all fat and meat; a leg bone works well. Place the bone in a jar. Cover with vinegar. Allow the bone to stand at room temperature for three to four days. At the end of this time the bone should be rubbery and pliable because the outer shell of the bone is the only remaining part.

At the conclusion of the demonstration, review the body's need for calcium and the effect of calcium deficiency on bone density.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Plastic bags
Specified amounts of flour for "calcium bags:"
- Newborn baby - 1/2 cup flour
- 10 year old - 3 1/2 cups flour
- 15 year old - 7 cups of flour

Chicken leg bone
Jar
Vinegar

ESSENTIAL ELEMENT

Science. Applied biology. Manipulating laboratory skills and equipment. The student shall be provided opportunities to demonstrate accepted and safe laboratory procedures to conduct biological investigations.

LESSON OBJECTIVE

Identify nutrients, their sources, and their functions.

ASSESSMENT CRITERIA

Demonstrate that mixtures may be easily separated using physical means.

ACTIVITIES & STRATEGIES

Introduce and discuss the following information with the students:
- Foods rich in iron are meats, fish, poultry, and legumes.
- Iron is added to cereal products to provide more nutrients in the cereal.
- The functions of iron are to make new cells, amino acids, and hormones. Iron carries oxygen throughout the body and is part of the hemoglobin.
- Iron is considered a trace mineral because the body needs it in small amounts.
- Heme iron, found in animal products, is more readily absorbed by the body than nonheme iron which is found in plant products.

Assign students to complete the following experiment:
- Select a breakfast cereal which is highly fortified with iron.
- Add water to the cereal in the beaker.
- Allow the cereal to soak for 15 to 30 minutes.
- Place the beaker on the magnetic stirrer with the bar magnet in the cereal. A regular magnet manually stirred through the cereal will also work.
- Spin for several minutes.
- Retrieve the magnet and observe the iron filings on the magnet.

Explanation of the experiments: The element iron is present in the cereal and is attracted to the magnet. Mixtures are produced by physical changes and the components are usually easily separated.

After completing the experiment, students should write these two headings on a sheet of paper, and write a summary under each heading.
- *Observations*
- *Conclusions*

After completion, ask students to share their summaries with the class.

RESOURCES & MATERIALS

Highly fortified breakfast cereal with 100 percent U.S. RDA of iron

Magnetic stirrer
Magnet retriever
Magnet
Large beaker
Water

ESSENTIAL ELEMENT

Science. Physical science. The use of skills in acquiring data through the senses. The student shall be provided opportunities to explore magnetic and electrical interactions.

LESSON OBJECTIVE

Compare the nutritive value of foods.

ASSESSMENT CRITERIA

Prove the presence of selected nutrients in foods through scientific analysis.

ACTIVITIES & STRATEGIES

Part 1 of a two-part lesson (nutrients)

Discuss the following statements with the students:
- No single food contains all the nutrients needed for growth and health.
- Food is composed of different nutrients needed for growth and health.

Inform the students that they will perform laboratory tests to prove the presence of the following selected nutrients in foods:
- fat
- starch
- sugar
- protein
- vitamin C

Instruct the students to travel to various stations that have been previously set up with supplies and food items as described in the teacher resource, "Laboratory Tests for Selected Nutrients in Foods." Upon completion of each test, the students should record their findings on a chart that they construct on a separate piece of paper. The chart should be titled, "Record of Laboratory Tests for Selected Nutrients in Foods."

Instruct the students to use the handout, "Appendix C: A Pattern for Daily Food Choices," to determine the food group of each food item.

RESOURCES & MATERIALS

Teacher Resource: "Laboratory Tests for Selected Nutrients in Foods"

Handout: "Appendix C: A Pattern for Daily Food Choices"

Solutions:
Iodine solution
Benedict's or Fehling's solution
Biuret's solution
Indophenol solution

Equipment:
Unglazed paper or brown shopping bag
Eye droppers
Test tubes
Racks
Bunsen burner

Food samples:
Potato
White bread
Apple
Cheese
Milk
Orange juice
Lemon juice
Ground beef
Egg white

ESSENTIAL ELEMENT

Science. Applied biology. Manipulating laboratory skills and equipment. The student shall be provided opportunities to demonstrate accepted and safe laboratory procedures to conduct biological investigations.

NAME ______________________________ **DATE** ________________

LABORATORY TESTS
FOR
SELECTED NUTRIENTS IN FOODS

Layout for record sheet that students will draw on a separate piece of paper:

1. Title of paper: "Record of Laboratory Tests for Selected Nutrients in Foods."
2. Turn paper on its side and divide into seven equal columns.
3. Titles of columns from left to right are: *Food Tested, Fat, Starch, Sugar, Protein, Vitamin C,* and *Food Group.*

1. Fat: Evidence of fat in food will show up on unglazed paper as a shiny spot that does not dry up as water would.
   a. Rub the food on a portion of unglazed paper.
   b. A shiny spot that does not dry indicates that there is fat in the food.
   c. A shiny spot that does dry indicates that there is water and no fat in the food.

2. Starch: Iodine solution on starch will produce a color change to blue-black.
   a. Place a drop or two of iodine solution on the food to be tested.
   b. Note immediate color change in foods containing starch.

3. Sugar: Benedict's or Fehling's solution will produce a color change from green to yellow to orange if sugars are present in the foods. (Sucrose, which is ordinary table sugar, will not work.)
   a. In a test tube, boil five milliliters of solution with the food to be tested.
   b. A positive test for sugars will result in a color change from green, to yellow, to orange,or red.

4. Protein: A test using Biuret's solution will produce a color change to a blue or blue/purple color if the food contains protein.
   a. Mix the food to be tested with a few drops of Biuret's solution.
   b. A color change to blue or blue/purple is a positive test for protein.

5. Vitamin C: A test using indophenol will produce a color change from blue to colorless if the food contains ascorbic acid.
   a. Place 4 ml of indophenol in a test tube.
   b. Add to the indophenol, a little at a time, an ascorbic acid mixture or a food to be tested.
   c. A color change from blue to colorless is a positive test for vitamin C.

You may choose to test any combination of the suggested foods, or any other foods that you prefer.

LESSON OBJECTIVE

Compare the nutritive value of foods.

ASSESSMENT CRITERIA

- Identify nutrients in foods.
- Classify foods according to the five food groups.

Science High School

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Part 2 of a two-part lesson (nutrients)

Instruct the students to take notes as you discuss the information regarding fat, carbohydrates, protein, and vitamin C from the "Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*.

Point out that all these substances are nutrients. ***Nutrients*** nourish and promote the growth of the human body. No one food contains all of the nutrients necessary for the body to function effectively. A nutritionally balanced diet provides appropriate amounts of the six essential nutrients when one eats the recommended servings from the food groups.

Emphasize that sugar and starch are two forms of carbohydrates.

Explain that there are many foods that will satisfy the suggested daily serving amounts of the five food groups found in "Appendix C: A Pattern for Daily Food Choices." Eating a variety of foods will supply the body with the necessary balance of nutrients and also provide a more interesting and diverse diet.

Distribute the worksheet, "Questions on Laboratory Results." Instruct students to use the findings they listed on their charts entitled, "Record of Laboratory Tests for Selected Nutrients in Foods" in the previous lesson. They will need to refer to the notes they just took and the handout, "Appendix C: A Pattern for Daily Food Choices," in order to complete the worksheet.

RESOURCES & MATERIALS

Worksheet: "Questions on Laboratory Results"
Handout: "Appendix C: A Pattern for Daily Food Choices"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

ANSWER KEY

Answers to questions 1, 2, 3, 5, 6, 8, 9, 11, 12, and 14 depend on what foods are tested.

4. Protein is used by the body for growth and repair of new and damaged tissues, regulating all body functions, transporting other nutrients and oxygen throughout the body, and supplying energy when adequate amounts are not supplied by carbohydrates and fats.

7. The body uses carbohydrates to supply energy and aid in the digestion of fats.

10. Functions of fat in the body include: energy provider, a transporter and absorber of fat-soluble vitamins, a cushion for vital organs, a part of the structure of body cells, a supplier of essential fatty acids, a flavor enhancer, an appetite satisfier, a body insulator, and a protector for nerves and blood vessels.

13. Vitamin C or ascorbic acid, helps fight infection, aids in healing of wounds, aids in the formation and maintenance of collagen, and aids in the absorption of iron and calcium.

ESSENTIAL ELEMENT

Science. Applied biology. Experience in oral and written communication of data in appropriate form. The student shall be provided opportunities to interpret meaningful arrangements of biological data.

NAME ______________________________ DATE ________________

Questions on Laboratory Results

1. What test results met your expectations? What results did not meet your expectations? Explain your answer.

2. What foods contained protein?

3. Place these foods in a food group.

4. What is the nutritional importance of protein?

5. What foods contained sugar and starch?

6. Place each of these foods in a food group.

7. What is the nutritional importance of carbohydrates?

8. What foods contained fat?

9. Place these foods in a food group.

10. What is the nutritional importance of fat?

11. What foods contained vitamin C?

12. Place these foods in a food group.

13. What is the nutritional importance of vitamin C?

14. Using your laboratory results, which food group(s) contain(s) each of these nutrients:
    a. Protein

    b. Starch

    c. Sugar

    d. Fat

    e. Vitamin C

LESSON OBJECTIVE

List the functions of dietary fiber in the body.

ASSESSMENT CRITERIA

- Plan a menu for one day which includes approximately 25 grams of fiber.
- Identify the importance of including enough high-fiber foods in the daily diet.

ACTIVITIES & STRATEGIES

Write the definition of ***dietary fiber*** on the chalkboard: the residue of plant food resistant to human digestive enzymes; that is, the part of the plant that cannot be digested.

Write the teacher information found in the opposite column on a transparency, the chalkboard, or poster board, and discuss with students.

Fiber has many problem-solving qualities. Using the worksheet, "Fiber in your Diet," match the medical problem with the fiber's ability to control or prevent the problem.

After the matching is completed, discuss the following statement with the students:

If fiber is good for us, then more will be better.

The answer to the above statement includes these facts:

- People could eat too much fiber food and not have enough capacity for food to supply food energy or nutrients.
- Elderly people, people on low-calorie diets, and children who have marginal or inadequate intakes of the vitamins and trace minerals could develop nutrient deficiencies.
- Iron and other nutrients in high-fiber foods may not have maximum absorption because of the faster transit of food in the intestinal tract.
- The average American eats approximately 11 grams of fiber a day. The suggested intake of fiber is between 20 and 30 grams a day.
- It is important to increase fiber in the diet gradually and at the same time to increase fluid intake.

Assign students to plan one day's menus which would provide approximately 25 grams of fiber. Use the food chart on the worksheet.

After completion, discuss the students' menus.

RESOURCES & MATERIALS

Worksheet: "Fiber in Your Diet"

"Changing the Course: Secondary Curriculum," American Cancer Society

Teacher information:
The two basic categories of fiber which perform different functions are:

- ***Soluble fibers*** - obtained from fruits and vegetables, oatmeal and oatmeal products, legumes, nuts, and seeds (pectin).
- ***Insoluble fibers*** - obtained from wheat bran and other grains; vegetables such as broccoli, peppers, cabbage, and some fruits (cellulose).
- A high-fiber diet helps prevent colon cancer.
- *Express Lane* indicates a fiber-full day. The food you eat should pass through you in about 24 hours. Intestinal cells have less time to come in contact with substances that may stimulate cancer.
- *Intestinal Traffic Jam* indicates a fiberless day. It can take two to three days for food to pass through the intestinal tract, thus permitting more time for intestinal cells to contact cancer-stimulating substances.

ANSWER KEY

1. F
2. H
3. E
4. G
5. A
6. J
7. B
8. D
9. C
10. I

ESSENTIAL ELEMENT

Science. Biology I. Application of science in daily life. The student shall be provided opportunities to evaluate consumer skills as they affect human well-being.

NAME ______________________________ **DATE** ____________________

Fiber in Your Diet

Match the benefit of the dietary fiber provided in the second column with the correct health problem in the first column by writing the correct letter in the blank space at the left. Each letter may be used only once.

_____ 1. appendicitis
_____ 2. cardiovascular disease
_____ 3. cholesterol
_____ 4. colon & rectal cancer
_____ 5. constipation
_____ 6. diabetes
_____ 7. diarrhea
_____ 8. diverticulosis
_____ 9. hemorrhoids
_____10. weight control

A. Some fibers attract water in the digestive tract and soften the stool.
B. Some fibers form a gel, helping to solidify watery stools.
C. Softer stools ease elimination for rectal muscles, and reduced pressure prevents rectal veins from swelling.
D. Fiber exercises the muscles of the digestive track, preventing weak areas in the large intestine thus keeping muscles from bulging out into pouches.
E. Soluble fiber in oat bran and dried beans as well as pectin and guar from fiber foods helps to reduce blood ________.
F. Prevents compaction of intestinal contents, thus preventing obstruction and inflammation.
G. Shortens *transit time* which prevents exposure to cancer-causing agents.
H. Fiber binds with bile and cholesterol and all are carried out with feces.
I. Promotes a feeling of fullness and helps control appetite.
J. Monosaccharides combine with fiber and produce a more even rise in blood glucose.

Using the chart below to choose your high-fiber foods, plan a day's menu which would provide approximately 25 grams of fiber. Be sure to include foods from all of the food groups.

Food Group & Foods	Serving	Grams of Dietary Fiber
Breads & Cereals		
All bran	1/3 cup	8.5
Bran muffin	1	4.0
Corn bran	2/3 cup	5.4
Oatmeal, cooked	1 cup	2.2
Whole wheat bread	1 slice	1.4
Legumes		
Kidney beans	1/2 cup	7.3
Pinto beans	1/2 cup	8.9
Vegetables		
Broccoli	1/2 cup	2.2
Corn, sweet, cooked	1/2 cup	4.7
Green peas	1/2 cup	3.6
Potatoes, with skin	1 medium	2.5
Spinach, cooked	1/2 cup	6.5
Fruits		
Apple	1 medium	3.5
Banana	1 medium	2.4
Orange	1 medium	2.6
Raisins	1/4 cup	3.1

LESSON OBJECTIVE

Analyze the factors involved in preventing food-borne illness.

ASSESSMENT CRITERIA

Analyze the factors involved in environmental and microbial contamination of food.

ACTIVITIES & STRATEGIES

Explain to students that food safety is a topic of interest and concern for professionals in the food industry as well as consumers. Consumers need to be informed about food safety practices in food processing plants and in the home. At least one million people in the United States suffer from food-borne illnesses each year.

Discuss the following questions with students.

- Define: microorganisms, food-borne infection, and food-borne intoxication. (Refer to the "Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*)
- How can food-borne illness be avoided? (Sanitary food handling and effective food preparation techniques)
- Define contamination. (Occurs when food comes in contact with something that is impure or harmful and causes the food to be unsafe)
- How can contamination be reduced? (Slowed by refrigeration or destroyed by heat)
- What foods produce toxins naturally? (Certain mushrooms and the leaves of rhubarb; a few other foods have small amounts, but are not considered dangerous when small amounts of the food are eaten; example solenin - the green part of potatoes)
- Name and describe some common food-borne illnesses of bacterial origin and the bacteria that causes the illnesses. (Refer to the introductory section of *ESR IV*, pp. 48-50)
- How do viruses, yeasts, and molds affect our food? (Refer to the introductory section of *ESR IV*, pp. 48-50)

Assign the students to research and write a report on different types of food-borne illnesses such as aflatoxin, salmonella, solenin, botulism, and listeriosis, or to read a current magazine or newspaper article about problems that have been identified in the food processing industry or in restaurants.

After completion, ask some students to share their information with the class.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Reference books
Magazines
Newspapers

ESSENTIAL ELEMENT

Science. Biology I. Experience in oral and written communication of data in appropriate form. The student shall be provided opportunities to describe biological processes and interactions.

LESSON OBJECTIVE

Discuss ways to achieve a low-fat diet.

ASSESSMENT CRITERIA

- Create a one-day *lactovegetarian* menu.
- Describe the reasons why eating meatless meals contributes to a low-fat diet.

ACTIVITIES & STRATEGIES

Discuss the following information regarding vegetarianism:
- ***Vegetarians*** eat differing diets depending on the type of vegetarian they are.
- A vegetarian diet consists of only plant foods such as fruits, vegetables, legumes, nuts, seeds, and grains. All animal products are omitted.
- A ***lactovegetarian*** diet uses plant foods with dairy products.
- A ***lacto-ovo-vegetarian*** diet includes plant foods, dairy products, and eggs.
- People choose to become vegetarians for a variety of reasons. Some reasons are listed in the opposite column.

Discuss the following information about protein:
- The structural units of protein are called ***amino acids***. Amino acids can be found in every cell of the body. ***Essential amino acids*** are those that must be provided in the diet. The body cannot produce essential amino acids sufficiently to meet the body's needs.
- ***Complete proteins*** come only from animal sources such as meat, milk, cheese, eggs, poultry, and fish. They are complete because they supply all of the essential amino acids needed by the body.
- Plant food products supply many amino acids, but they do not contain all of the necessary amino acids. Plant food products are considered incomplete proteins. ***Incomplete proteins*** do not contain all of the essential amino acids needed by the body. Plant food products include: cereals from the various grains, vegetables, fruits, legumes (dried beans and peas), and nuts. Incomplete protein foods eaten in combination provide a complete protein.

Remind students that animal foods often provide ***saturated fat*** in the diet. Reducing the intake of animal foods will reduce fat intake automatically.

Distribute the worksheet and handout. Review the documents and instruct students to complete the worksheet, "Vegetarian Style."

RESOURCES & MATERIALS

Worksheet: "Vegetarian Style"
Handout: "Appendix C: A Pattern for Daily Food Choices"

Reasons people choose to become vegetarians:
- **Economic reasons.** Animal foods cost more than foods used in a vegetarian diet.
- **Ecological reasons.** Animals eat 2 to 10 pounds of grain for each pound of meat produced. Some people choose to eat less meat so that there will be more grain left for food.
- **Philosophical reasons.** Many vegetarians do not believe in killing animals. Religious beliefs may discourage or prohibit eating foods that come from animals.
- **Health reasons.** Vegetarian diets contain less fat and cholesterol and more fiber. Vegetarians are more likely to be at desired weights and have lower rates of certain kinds of cancer and fewer deaths from cardiovascular diseases.

TEACHER TIP

Choosing food wisely is essential to success as a vegetarian. Deficiencies in the diet can arise when correct food selections are not made. Persons interested in vegetarianism should consult a physician and a registered dietitian before making any dietary changes.

ANSWER KEY

1. **Pros could include any of the reasons people become vegetarians, listed under the activities and strategies. Cons could include a vitamin B_{12} deficiency and a lack of protein in the diet due to fiber inhibiting protein absorption and/or inadequate calorie consumption resulting in the body using protein for energy.**
2. **Answers will vary.**
3. **Animal foods often provide saturated fat in the diet.**

Bonus Question: Emphasis on health and fitness may continue, encouraging more people to become vegetarians.

ESSENTIAL ELEMENT

Science. Applied biology. Application of science in daily life. The student shall be provided opportunities to apply biological knowledge in a manner that benefits self, society, and environment.

NAME ______________________________ **DATE** ________________

Vegetarian Style

Protein is the main component of every cell in the human body. Without protein, the human body would not be able to survive. Protein performs three very important functions:

- Growth and repair of new and damaged tissues
- Regulating body functions and transporting other nutrients and oxygen throughout the body
- Supplying energy when adequate amounts are not supplied by carbohydrates and fats

Vegetarians get their protein by combining foods. The amino acids that one food is missing must be supplied by another food. Examples of combinations of foods with incomplete proteins that produce the equivalent of complete proteins include the following:

- legumes and rice
- whole wheat bread and peanut butter
- leafy vegetables, legumes, and cereals
- cereal with milk
- lentils and rice
- beans and corn
- macaroni and cheese

Plant foods are usually high in fiber. The fiber may affect the body's ability to digest the plant protein found in vegetables. This can make it more difficult to consume adequate protein levels. Most plant foods are not only high in fiber, but also low in calories. If a person does not consume enough calories, the body must rely on protein to provide the body's energy supply. Sufficient calories, preferably from complex carbohydrates, must be included in the diet to keep the body from using protein as an energy source.

Another problem can occur when a person does not eat animal protein. A lack of foods from animal origin may result in a deficiency of vitamin B_{12}. Vitamin B_{12} is found only in foods of animal origin. Individuals who do not eat animal protein need to supplement their diets with vitamin B_{12}.

1. *List two pros and two cons to eating a vegetarian diet.*

2. *Create a lactovegetarian (a diet that includes dairy products as well as plant food) menu for one day using the handout, "A Pattern for Daily Food Choices," and the list of ways to combine incomplete proteins found above. Make sure that you include all the necessary servings of foods as stated in the pattern. Note that dry beans, peas, nuts, and seeds can be included in a vegetarian diet to meet protein needs as long as they are combined with other plant foods to balance them out. The meal pattern should include breakfast, lunch, dinner, and as many snacks as necessary to provide needed servings.*

3. *Why is it good to include meatless meals in your diet if you are trying to reduce the amount of fat you consume?*

Bonus Question: *Why would you think there might be more vegetarians in the United States in five years?*

LESSON OBJECTIVE

Evaluate dietary needs of women during pregnancy and lactation.

ASSESSMENT CRITERIA

Compose a one-day menu that meets the Recommended Dietary Allowances during pregnancy.

Science High School

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Discuss the following information with the students:

- Many young women do not realize that their nutritional health during the years *before* they become pregnant has an effect on their future pregnancy and the development of the fetus.
- It is important to realize that decisions an expectant mother makes about nutrition affect her baby's health and future.
- The growth and development of the fetus increases the daily nutrient needs of the expectant mother. An increase of protein, folate, vitamin B_{12} (cyanocobalamin), calcium, phosphorus, magnesium, and iron is necessary to supply enough nutrients for fetal growth and development as well as for the mother's nutritional health.
- The practice of good nutrition during pregnancy is critical. During the first trimester, or approximately the first thirteen weeks, inadequate nutrition or drug use can result in birth defects.
- During the second trimester, the fetus continues to grow and develop, and bones become noticeable throughout the fetus' body.
- The third trimester is also a very critical time for development. Deficiencies in certain nutrients can cause damage to the eyes, brain, and genitals as the fetus completes development.
- The *RDA* is the Recommended Dietary Allowances for Americans. The RDA serves as a guideline for determining the amounts of nutrients a specific person needs each day. It gives the specific recommended daily nutrient needs for a person according to age and gender.
- The United States Department of Agriculture's "Pattern for Daily Food Choices" suggests the number of servings to choose from each food group daily.

Instruct the students to complete the worksheet, "One-Day Menu for a Pregnant Woman." The RDA for the following nutrients must be met: protein, folate, vitamin B_{12}, calcium, phosphorus, magnesium, and iron.

RESOURCES & MATERIALS

Worksheet: "One-Day Menu for a Pregnant Woman"

Handout: "Appendix C: A Pattern for Daily Food Choices"

Handout: "Appendix D: Recommended Dietary Allowances"

Handout: "Appendix E: Food Composition Table"

TEACHER TIP

Follow-up exercise: Research and report on the nutrients needed during pregnancy. Divide students into seven groups, assigning each group one of the nutrients. Instruct the group to write a description of each nutrient's food sources, functions, and symptoms of deficiency.

ESSENTIAL ELEMENT

Science. Applied biology. Experience in skills in relating objects and events to other objects and events. The student shall be provided opportunities to study the relationship between scientific research findings and their impact on society and the environment.

NAME ______________________________ DATE ____________________

One-Day Menu for a Pregnant Woman

Instructions: Use the handouts, "Appendix C: A Pattern for Daily Food Choices," "Appendix D: Recommended Dietary Allowances," and "Appendix E: Food Composition Table." Find foods on the Food Composition Table that meet the requirements for a pregnant woman and represent your ideas on the menu below. List the amounts of the particular nutrients found in each food item, and then total them, to find if you have planned the RDA for one day.

	Protein	*Folate*	*Vitamin B_{12}*	*Calcium*	*Phosphorus*	*Magnesium*	*Iron*
Breakfast							
Snack							
Lunch							
Snack							
Dinner							
Snack							
Total							
Nutrient RDA's							

Science High School

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Describe the relationship between nutrition and the prevention and treatment of health problems (cancer, common cold, diabetes, heart disease, PKU).

ASSESSMENT CRITERIA

Recognize the cause, the effect, and the treatment of phenylketonuria, or PKU.

ACTIVITIES & STRATEGIES

Display empty containers of diet soft drinks sweetened with NutraSweet and packages of Equal.

The teacher could choose to:
- Conduct a classroom discussion on PKU with information from the transparency, "Phenylketonuria—PKU" and assign study questions from the transparency, "Study Questions—PKU."
- Assign a short, independent research project in the library to find cause, effect, and treatment of PKU.
- Invite the school nurse, dietitian, or other medical personnel as guest speaker.

Discuss the following information on aspartame.
- Aspartame is an artificial sweetener that is marketed as NutraSweet when used as a food additive and as Equal when used as a table sugar substitute. Aspartame is composed of two amino acids, phenylalanine and aspartic acid, and methanol. People with PKU should avoid products containing aspartame.
- The Federal Food and Drug Admstration (FDA) approved aspartame based on the assumption that no one would consume more than the maximum amount recommended which is 50 mg per kg of body weight per day.
- The Canadian Diabetes Association recommends only three to four packs of Equal a day.
- Foods which contain aspartame as a sweetener include diet drinks, chewing gum, pre-sweetened cereal, pudding, and gelatin desserts.

Discuss alternate sources that would help a person with PKU meet the dietary requirements for protein.

The PKU child is generally not allowed milk and meat. A special formula used as a milk substitute can help a person with PKU meet dietary requirements.

RESOURCES & MATERIALS

Transparency: "Phenylketonuria—PKU"

Transparency: "Study Questions—PKU"

Encyclopedia

ANSWER KEY

1. **An artificial sweetener composed of two amino acids, phenylalanine and aspartic acid, and methanol.**
2. **NutraSweet; Equal**
3. **The inherited inability to dispose of the amino acid, phenylalanine, when it is eaten in excess of the need for building proteins.**
4. **The brain does not develop normally which causes severe mental retardation.**
5. **One of the amino acids which make up proteins and one of the amino acids in aspartame.**
6. **Phenylalanine is one of the essential proteins needed for protein synthesis to be completed.**
7. **The doctor tests blood samples taken from the baby's heel when it is a few days old.**
8. **People who have PKU must avoid meat and milk (high-quality protein) until their doctor changes their diets.**
9. **One of the ingredients in aspartame is phenylalanine, which is an amino acid.**
10. **Answers will vary.**

ESSENTIAL ELEMENT

Science. Biology I. Experience in oral and written communication of data in appropriate form. The student shall be provided opportunities to measure biological processes and interactions.

Phenylketonuria—PKU

Phenylketonuria—PKU is an inherited disorder. There is a deficiency of the enzyme that metabolizes phenylalanine in the liver. Therefore, phenylananine builds up to toxic levels in the blood.

Phenylalanine is an essential amino acid. Tyrosine is a nonessential amino acid because phenylalanine can be converted into tyrosine. A person with PKU does not have sufficient enzyme action to convert phenylalanine to tyrosine. Both amino acids become essential amino acids which must be obtained from the protein foods a person eats.

Protein synthesis stops when the supply of any one of the essential amino acids is depleted. The diet must contain some phenylalanine to complete the protein synthesis. However, if too much protein is consumed, a buildup of phenylalanine is developed which could cause mental retardation and abnormal growth and development.

Before testing became available, babies born with PKU suffered from abnormal brain development resulting in severe mental retardation. In Texas, by law, all newborns must be tested for PKU a few days after birth. The Guthrie test is the one most commonly used. Infants with PKU cannot be breast-fed because of the amount of phenylalanine in human milk.

Diet is absolutely necessary in the control of PKU. The results of noncompliance are devastating. A special diet must begin before the infant is two months old and must continue. Special formula is used by persons with PKU. A woman with PKU who becomes pregnant must let her physician know that she has PKU. She also needs to follow a prescribed diet and consult with a dietitian who can monitor her diet.

Since phenylalanine is an amino acid, milk, milk products, meat, fish, and high-protein foods must be avoided. The diet should include fruits, vegetables, and cereals. The person with PKU should not use soft drinks or other foods in which aspartame is an additive. Their bodies cannot metabolize phenylalanine which is an amino acid used in aspartame. Medical monitoring must be a part of the diet treatment.

NAME ______________________________ **DATE** ________________

Study Questions—PKU

1. Define aspartame.

2. Trade names of aspartame are__________when used in food and __________when used as a sugar bowl substitute.

3. Define PKU.

4. Explain the effect of PKU on infants and children.

5. Define phenylalanine.

6. Explain why it is important to include some phenylalanine in the diet for people other than those with PKU.

7. Explain how PKU is diagnosed.

8. Explain the treatment for a person with PKU. How long must it continue?

9. Explain why a person with PKU cannot use aspartame.

10. What changes would you have to make in your lifestyle if you had PKU?

LESSON OBJECTIVE

Review current events in the field of nutrition.

ASSESSMENT CRITERIA

- Analyze the different types of artificial sweeteners.
- Compare the calories in sugar and artificial sweeteners.

ACTIVITIES & STRATEGIES

Write this term and its definition on the chalkboard: ***Artificial sweeteners*** refer to substances that are imitations or substitutes for natural sugar which are sometimes used as sweetening agents in foods and beverages.

Explain that artificial sweetener is sometimes referred to as a fabricated food or a food additive.

Discuss the artificial sweeteners approved by the Food and Drug Administration (FDA) by using the transparency, "Artificial Sweeteners."

Write the calories of the following foods on the chalkboard:
- sucrose (table sugar) - 16 calories per teaspoon
- honey - 22 calories per teaspoon
- pancake syrup - 16 calories per teaspoon

Compare the calories in artificial sweeteners with the calories in sucrose, honey, and pancake syrup.

After discussing the information from the transparency, "Artificial Sweeteners," tell the students to write the answers to the following questions:
- Is the risk of developing cancer from saccharin consumption worth the benefit of using this sweetener? Explain.
- If you were a member of Congress, explain why you would vote to ban or to keep saccharin (in prepared foods) on the market? (Canada has banned saccharin.)
- Considering the effects of aspartame on people with PKU, would you consider aspartame a safe sweetener?
- What needs to be included on the label of foods containing aspartame?
- Considering the scientific research and knowledge which we have today, what types of sweeteners will be on the market in the next 25 years?

Allow time for students to discuss their answers.

RESOURCES & MATERIALS

Transparency: "Artificial Sweeteners"

Overhead projector

ESSENTIAL ELEMENT

Science. Physical science. Application of science in daily life. The student shall be provided opportunities to analyze the use of chemicals in everyday activities of the home and industry.

Artificial Sweeteners

Saccharin

- 500 times sweeter than sucrose
- Calories: 4 per packet of Sweet and Low
- First produced in 1879
- FDA attempted to ban it in 1977. Laboratory animals suffered bladder cancer when given high doses and administered over two generations.
- The only artificial sweetener available in 1977
- People demanded that it remain on the market.
- Congress prevented the ban until 1992 when the current moratorium expires.
- A warning label must accompany any use.
- Produced from toluene and petroleum

Aspartame

- 200 times sweeter than sucrose
- Calories: 4 per packet of Equal
- First available in 1981
- Brand names: NutraSweet when added to foods
  Equal when sold as a powder
- No link to cancer has been discovered.
- 4000 complaints were filed with the FDA before 1987 due to reactions such as headaches, dizziness, allergic reactions, nausea, and seizures.
- Composed of phenylalanine (an amino acid) and aspartic acid.
- Methanol is added to aspartame. Methanol is an alcohol, also called methyl or wood alcohol. This is disturbing to some people,but it is said that the amount of methanol in a soft drink equals the amount in a cup of fruit or vegetable juice.
- People who have the disease called phenylketonmia (PKU) cannot use aspartame.
- Product labels containing aspartame must warn people with PKU not to use the product.

Acesulfame-K

- 200 times sweeter than sucrose
- Calories: 4 per packet of Sunette or Sweet One
- Approved in 1988
- Sometimes called acesulfame-potassium
- Brand name: Sunette or Sweet One
- Used in dry foods such as chewing gum, gelatins, nondairy creamers, powdered drink mixes, and puddings

Cyclamate

- Calories: not listed
- Used in the 1950s and 1960s
- Banned in 1970 by the FDA; linked with cancer and birth defects
- Some FDA officials believe the ban is unwarranted.

LESSON OBJECTIVE

Explain the physiological, psychological, and social implications of food.

ASSESSMENT CRITERIA

Analyze the psychological aspects of appetite and food intake.

ACTIVITIES & STRATEGIES

Discuss with the students the many roles that food plays besides providing nourishment to the body. For most people, food has an emotional value that is influenced by intrinsic and extrinsic factors.

Divide the students into small groups. Use the teacher resource, "Psychological Aspects of Appetite and Food Intake," to explain a mind-mapping activity.

Ask each group of students to diagram their own mind map and expand on the intrinsic and extrinsic factors by filling as many boxes as possible.

When the students complete the exercise, come back together as a class and discuss the various ideas.

On a large sheet of butcher paper, ask some students from each group to diagram a mind map and write in their intrinsic and extrinsic factors.

Ask each group to discuss their contributions to the mind map.

RESOURCES & MATERIALS

Teacher Resource: "Psychological Aspects of Appetite and Food Intake"

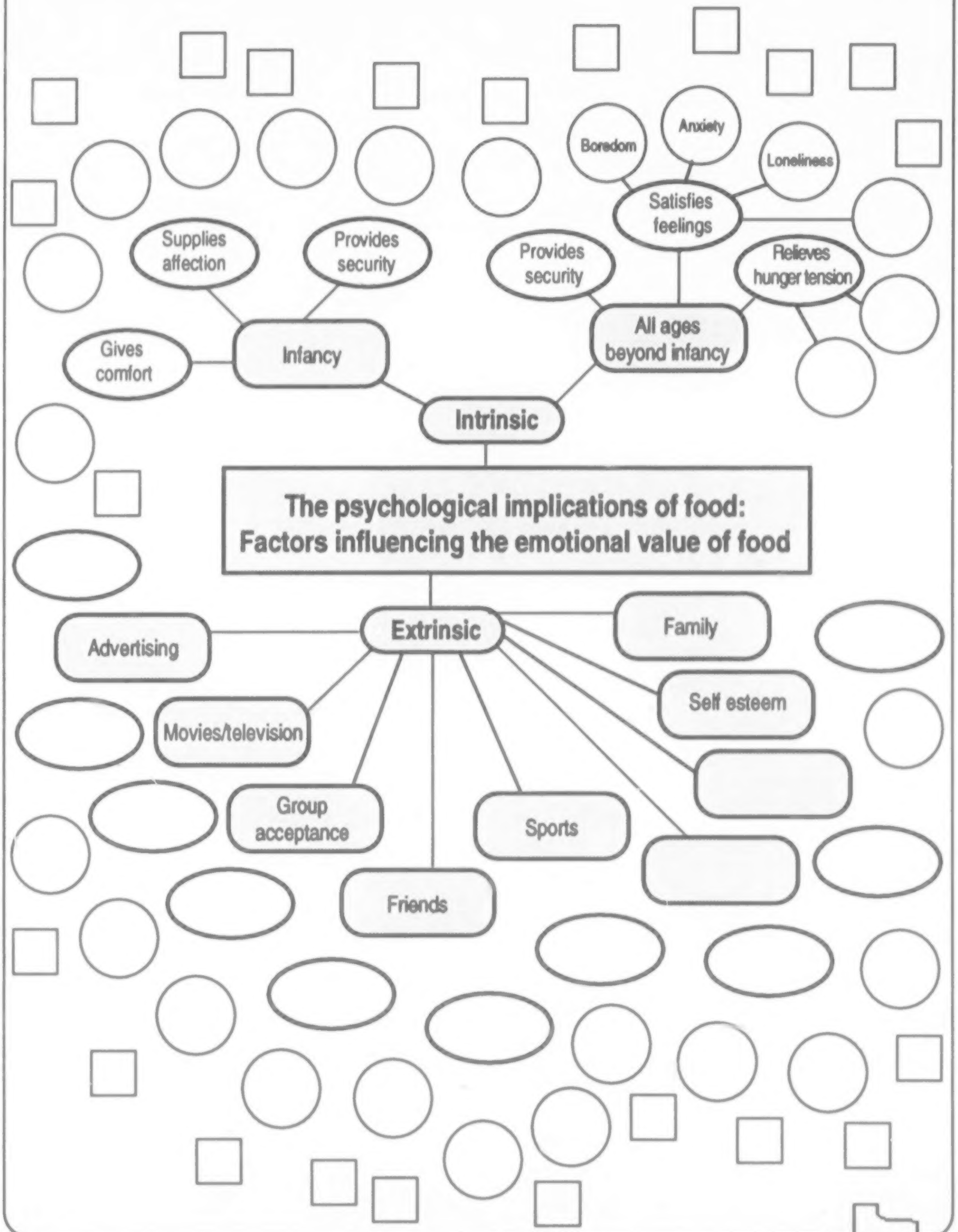
"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Chalkboard or overhead projector

ESSENTIAL ELEMENT

Social studies. Psychology. Nature of psychology. Human growth, development, and behavior. The student shall be provided opportunities to explain motivation and emotion.

Psychological Aspects of Appetite and Food Intake


The psychological implications of food: Factors influencing the emotional value of food
Intrinsic
Infancy
Gives comfort
Supplies affection
Provides security
All ages beyond infancy
Provides security
Satisfies feelings
Boredom
Anxiety
Loneliness
Relieves hunger tension
Extrinsic
Advertising
Movies/television
Group acceptance
Friends
Sports
Family
Self esteem

LESSON OBJECTIVE

Recognize the effects of food on health and appearance.

ASSESSMENT CRITERIA

Recognize that a nutritional breakfast provides important nutrients for our health.

Social Studies **High School**

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Invite the school cafeteria manager to be a guest speaker and discuss the following topics:
- different foods served in cafeteria, especially for breakfast
- serving time for breakfast
- cost of different foods

Distribute and review the worksheet, "Breakfast Around the World."

Discuss the importance of breakfast to our health and appearance.

Write the pattern of a good breakfast on the chalkboard.
- Fruit, fruit juice, or vegetable juice provides vitamin C.
- Enriched or whole-grain bread and/or cereal provides vitamin B complex and iron.
- Milk provides calcium for healthy bones and teeth, vitamin A, and vitamin D.
- Protein food, such as eggs or meat, builds and repairs body tissues; however, many breakfast meat products contain a large amount of fat, cholesterol, and sodium.

Assign students to evaluate the breakfast that they ate this morning. What improvements should be made?

Discuss the different breakfasts from other countries. Assign the class to decide on a menu for the school cafeteria manager to prepare for an international breakfast.

Extension or extra-credit activity:
Ask a student or students to research any needed recipes for the cafeteria manager; prepare labels for the name of the country and the foods; prepare labels with the name and benefit of the nutrients received from the foods that will be served at the international breakfast.

Arrange for the cafeteria manager to prepare breakfast foods of other countries and for the class to meet at the cafeteria on the designated day and time for the international breakfast.

RESOURCES & MATERIALS

Worksheet: "Breakfast Around the World"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

TEACHER TIP

If there is more than one class section, check with the cafeteria manager to determine if it would be better to have one section each day or prepare the international breakfast only on one day.

The cafeteria manager could compare breakfast patterns in the United States and other countries to create more interest in the school breakfasts.

ESSENTIAL ELEMENT

Social studies. World geography. Nature of geography. The student shall be provided opportunities to identify specialized fields of geography (e.g., physical, cultural, political, economic, historical).

NAME ______________________________ DATE ________________

BREAKFAST AROUND THE WORLD

The advantages of eating breakfast are:

- provides energy
- helps prevent a mid-morning slump
- should provide one-fourth to one-third of the day's total nutritional needs
- helps provide a vitamin C-rich food for the day
- helps provide needed nutrients to prevent some types of illness
- helps provide nutrients for healthier hair, skin, eyes, and finger nails
- helps one to be more alert, which
  - aids in attaining better grades
  - aids in production on the job
  - helps prevent accidents on the job

BREAKFAST PATTERNS FROM OTHER COUNTRIES

China

Joe (soup and rice)
Jeoiz (steamed dumplings)
Hot tea, juice, or milk

England

A hearty breakfast:
Eggs and bacon
Fried bread with marmalade
Hot tea
Popular foods in some areas:
Fruits and fruit juices
Main dish pies
Ham
Smoked fish
Oatmeal porridge

Scotland

Heartier than an English breakfast:
Porridge with baps (soft breakfast rolls)
Kippers (salted and dried herring)
Steaming tea
Marmalade (developed in Dundee)
Breakfast sausage (developed in Aberdeen)

Lebanon

Manakeesh thymby (flattened, baked bread topped with thyme, sesame seeds, sumac, olive oil, onions, tomatoes)
Fresh mint, tomatoes, cucumbers, olives
Hot tea

France

Lepetit dejeuner—breakfast:
(Usually a light meal)
Hot milk and coffee
Brioche (crusty, sweet bread)
Butter and jam

Germany

A hearty breakfast:
Eggs with dark bread
Freshly baked crisp rolls
Butter and jams
Coffee and milk
Colder climates include:
Ham, sausage, cheese, and eggs

Denmark

Danish *Dairy Right* Breakfast:
(A high-protein meal)
Yogurt
Ymer (a high-protein milk product)
Sour milk on cereal
Bread and cheese
A boiled egg
Juice and milk
Strong coffee
Weinerbrod (layers of buttery pastry, filled with fruit or custard, sprinkled with sugars or nuts)

Greece

Greeks appreciate simple pleasures:
Dry bread and warm milk
Sometimes eggs or cheese

1. Evaluate the breakfast which you ate this morning, comparing it to the breakfast pattern discussed.
2. Write a list of countries, selected from those above, to be used in a Continental Breakfast to be served in the cafeteria.

Social Studies High School

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Describe the relationship between nutrition and the prevention of health problems (cancer, common cold, diabetes, heart disease, PKU).

ASSESSMENT CRITERIA

Analyze the effects of the economy and/or geographic location on our chances of having cancer.

ACTIVITIES & STRATEGIES

It has been stated that the economy of a nation can be determined by the amount of fat eaten by the people. In times of famine, people crave fat foods because it provides a satisfying feeling.

Distribute and study the handout, "Cancer and the Economy."

Tell the students that while it is true that some forms of cancer seem to be hereditary, the major forms of cancer, except lung cancer, seem to be related to obesity. Within the country, prevalence of some cancers vary with income. In the United States, Seventh Day Adventists, Mormons, and vegetarians have a lower mortality rate from cancer than the general population.

Discuss the dietary habits of these groups. What are the differences in the family life of these people? What are the differences in their family activities? What is the difference in stress in these families and our families?

Additional discussion questions:

- Why would Japan and developing countries have a low rate of lung cancer?
- Do you think Japan will continue to have a low rate of lung cancer ten years from now?
- If people in the United States become more interested in cutting back on fats and animal products, how will this affect the price of these products?
- Do you think the American people will be willing to decrease the amount of animal products eaten?
- Explain the economic effects on the family if the mother, father, or child has cancer.

Discuss the dietary recommendations that are listed on the handout, "Cancer and the Economy." Assign the students to evaluate their diet according to these recommendations, draw some conclusions concerning their diets, and write a summary of ways to lower their cancer risk.

RESOURCES & MATERIALS

Handout: "Cancer and the Economy"

"Changing the Course: Secondary Curriculum," American Cancer Society

TEACHER TIP

Seventh Day Adventists and Mormons:

- **do not drink coffee or alcohol, or any drinks which contain caffeine**
- **most do not smoke cigarettes**
- **many do not eat meat**
- **most emphasize the importance of a nutritionally balanced diet**
- **are very family-oriented**

ESSENTIAL ELEMENT

Social studies. Economics. American free enterprise system. The student shall be provided opportunities to analyze how supply and demand affect prices.

Cancer and the Economy

The types and amount of cancer occurring in different geographical locations has led scientists to reach many hypotheses, but the amount of accuracy in the data is limited.

Types of Cancer	Countries with a high cancer rate	Countries with a low cancer rate
Lung cancer	United States and England One-third of all lung cancer in North America is due to smoking tobacco.	Japan and developing countries
Colon cancer	United States and England When Japanese people immigrate to the United States, they decrease in the rate of stomach cancers and increase in the rate of colon cancer.	Japan and developing countries Greenland Eskimos eat very little fiber, with a diet extremely high in fat. However, the fat is mostly omega-3 fatty acids from the fish they eat.
Stomach or gastric cancer	Japan Chile Austria Finland Iceland	United States A decline in stomach cancer in U.S. due to people eating less salt-cured and salt-pickled food
Liver cancer	China Hawaii Rumania sub-Saharal Africa	United States
Breast cancer	Italian women develop breast cancer 3 times more often than Japanese women. American women develop breast cancer 4 to 5 times more often than Japanese women.	Japan—women eat about 20% fat. Since Japan has become more westernized, breast cancer is increasing.
Prostate	Some research groups showed that obese people and those who eat large amounts of animal and dairy products are three and a half times as likely to develop prostate cancer.	

The relationship between diet and cancer are complex. Many theories differ with individuals and with location of the cancer in the body. Cancer could be related to factors in the individual as well as in the environment.

Dietary recommendations to reduce the risk of cancer:
- Maintain a desirable weight, according to age and size.
- Reduce your fat intake to 30% of total calories. Eat less heavily-marbled meats, fried foods, bacon, and high-fat desserts.
- Select more low-fat dairy products such as low-fat yogurt, cottage cheese, and skim milk.
- Eat more fiber-rich, whole-grain, or whole wheat breads, cereals, pasta, all types of fruit and vegetables, legumes, and oat-based products.
- Increase your daily intake of dark yellow or green fruits and vegetables rich in beta-carotene.
- Choose a variety of vitamin C-rich foods such as citrus fruits, tomatoes, and dark green, leafy vegetables.
- Include vitamin E in your diet by eating a variety of vegetables and whole grains. For cooking, use a small amount of polyunsaturated oils.
- Consume foods such as salt-cured, smoked, and nitrite-cured foods in moderation.

Social Studies High School

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Examine food traditions at home and around the world.

ASSESSMENT CRITERIA

Identify the types of breads and grains from countries around the world.

ACTIVITIES & STRATEGIES

Part 1 of a two-part lesson (breads and grains)

Bread is the oldest food manufactured and the most widely eaten; therefore, it is often called the staff of life.

The earliest breads were a mixture of ground grain and water. The bread was hard, flat, and baked in the sun or on hot rocks. Most of the bread we eat today is leavened.

Tell students to list many different kinds of breads and ask one student to record them on the chalkboard. Discuss similarities and differences of the breads listed.

Ask a student to find and read the definition of leaven from a dictionary. (***Leaven*** is a substance which causes dough to rise.)

Display examples of leavening agents such as yeast, baking powder, and baking soda.

Discuss the advantages of using a leavening agent in baking breads. Explain that we should use different leavening agents in different products. Examples are:

- use yeast in dinner rolls and certain loaves of breads
- use baking powder in biscuits and muffins
- use baking soda when sour milk is an ingredient in biscuits, muffins, and pancakes

Distribute the worksheet, "Breads and Grains."

Assign each student or group of students a country or countries to research. Ask them to use their textbooks and library resources for information about the grains that are most widely used in their assigned countries. Look for references on the country and the type of bread to determine the grains used.

After research is completed, ask each group to report to the class on their country, bread, and grain. Instruct the class to fill in the worksheet as they listen to each report.

RESOURCES & MATERIALS

Worksheet: "Breads and Grains"

Dictionary
Local World Geography textbooks
Cookbooks on foreign foods
Yeast
Baking powder
Baking soda

ANSWER KEY

Grains

1. teff (sorghum) or wheat
2. cassava roots
3. corn or wheat
4. corn
5. rye
6. wheat
7. rye
8. wheat
9. unsifted rye flour
10. wheat
11. wheat
12. potatoes, wheat
13. matzo meal
14. wheat, corn, rice
15. rice, bulgur
16. rice
17. rye, wheat
18. barley, oats
19. rye, wheat
20. oats

TEACHER TIPS

- **Match a country to its bread if time does not permit going to the library.**
- **Extension: Ask for volunteers to research cookbooks and prepare samples of different breads to bring to class during the week.**

ESSENTIAL ELEMENT

Social studies. World geography. Nature of geography. The student shall be provided opportunities to identify specialized fields of geography (e.g., physical, cultural, political, economic, historical).

NAME ______________________________ **DATE** ____________________

Breads and Grains

Complete the following chart by researching each of the countries which are listed in the left column. The name of the bread typical of that country is in the *Bread* column. Write the grain or grains commonly used in each country in the *Grain* column.

	Country	Breads	Grains
1.	Africa	kesra	
2.	Brazil	manioc	
3.	Central America	tortilla	
4.	Columbia and Venezuela	aprepa	
5.	Denmark	smorrebrod	
6.	England	crumpet	
7.	Finland	rye bread	
8.	France	croissant	
9.	Germany	pumpernickel	
10.	Greece	baklava and psomi	
11.	India	chapati	
12.	Ireland	potato bread	
13.	Israel	challah	
14.	Italy	sourdough bread	
15.	Middle East	pita bread	
16.	Taiwan	rice cake	
17.	Russia	blini and kulich	
18.	Scotland	bannock	
19.	Spain	pan de Santa Teresa	
20.	Wales	bara ceirch	

LESSON OBJECTIVE

Identify nutrients, their sources, and their functions.

ASSESSMENT CRITERIA

- Identify the types of breads and grains used in different countries.
- Analyze the importance of breads in the diet and in relation to the economy.

ACTIVITIES & STRATEGIES

Part 2 of a two-part lesson (breads and grains)

Ask the cafeteria manager to describe bread preparation by giving the name of the product, the grain used, the leavening agent, and the baking procedure. Serve samples to class members.

Using the information from Part 1 of this lesson, list the grains that are used in the different countries. Which countries produce an insufficient amount of grain for their population? (Mexico, India, Africa, Russia, and some South American countries)

What countries would have excess grains to export products to these countries? (USA, Canada, Germany, and England)

What determines a country's ability to export products to other countries? (free trade, tariffs, quotas, or other trade barriers)

Tell students to use their textbooks to define the following words:
- free trade
- tariff
- protectionism
- subsidy

Discuss the United States' policies on exporting and importing foods.

Distribute the worksheet, "Grains and Their Nutritive Value," to the class. Instruct the students to complete the worksheet by filling in the nutrients in the different parts of the diagram of a grain kernel.

After completion, review and discuss the information and the answers with the class.

Social Studies **High School**

HS

TEXAS EDUCATION AGENCY

RESOURCES & MATERIALS

Worksheet: "Grains and Their Nutritive Value"

"Grains," a poster available from the Kansas Wheat Commission

Textbooks

ANSWER KEY

Bran
1. **Thiamin**
2. **Riboflavin**
3. **Niacin**
4. **Pyridoxine**
5. **Pantothenic acid**
6. **Iron**
7. **Calcium**
8. **Phosphorus**
9. **Fiber**

Endosperm
10. **Carbohydrates**
11. **Incomplete protein**

Germ
12. **Vitamin E**
13. **Phosphorus**
14. **Iron**
15. **Fat**
16. **Fiber**

In advance, check with the cafeteria manager about describing or demonstrating different kinds of bread baking.

ESSENTIAL ELEMENT

Social studies. World geography. Nature of geography. The student shall be provided opportunities to identify specialized fields of geography (e.g., physical, cultural, political, economic, historical).

NAME ________________________________ **DATE** ________________

Grains and Their Nutritive Value

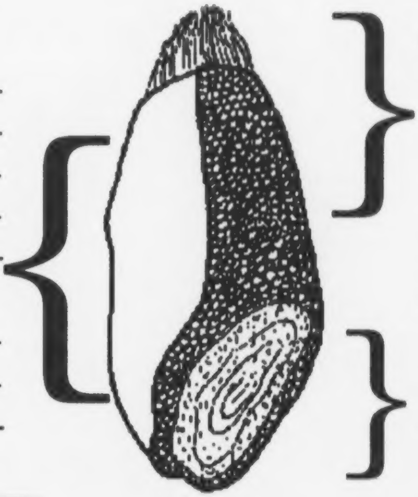
Grain is the dietary mainstay for many people in the world. Unrefined grain products, such as rice and corn, supply the main source of food energy for developing nations. Oats, rye, sorghum, and millet are grains that provide the basic nourishment in many countries.

Each cereal kernel is covered with a husk or chaff which is removed before it is edible. Each kernel consists of 3 parts:

- **Bran** - the outer protective covering
- **Endosperm** - the inside part, which is the largest
- **Germ** - the part which sprouts to form a new plant

Each part of the grain kernel contains specific nutrients

- ***Bran*** B vitamins: thiamin, riboflavin, niacin, pyridoxine, and pantothenic acid
  Minerals: iron, calcium, and phosphorus
  Fiber or cellulose (not a nutrient, but very important)
- ***Endosperm*** Carbohydrates and low-grade protein
- ***Germ*** Vitamin E
  Minerals: phosphorus and iron
  Fat
  Fiber or cellulose (not a nutrient, but very important)



Bran

Vitamins:

1. ____________
2. ____________
3. ____________
4. ____________
5. ____________

Minerals:

6. ____________
7. ____________
8. ____________

Valuable Substance: 9. ____________

Endosperm

Nutrients:

10. ____________
11. ____________

Germ

Vitamin: 12. ____________

Minerals:

13. ____________
14. ____________

Other nutrient:

15. ____________

Valuable Substance:

16. ____________

Formulated foods are food products developed to supplement diets and feeding programs for people who are malnourished or suffering from some nutritional deficiency.

- **Incaparina** - a mixture of corn and cottonseed flour used as part of a supplemental feeding program in Central America and Panama.
- **Bennimix** - a protein-rich flour developed in Sierra Leone in West Africa to supplement the diets of infants and children. It is made from rice, benniseed (a variety of sesame seed), and peanuts. Malnourished children began to thrive when bennimix was added to their diets.
- **Nepal** - a mixture of soybeans, corn, and wheat. This "superflour," used to make a porridge, showed improved overall general health and weight gain when fed to malnourished children and their mothers for ten days.

LESSON OBJECTIVE

Examine food traditions at home and around the world.

ASSESSMENT CRITERIA

Identify ways that special occasions in our culture influence our food choices.

Social Studies High School

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Write this definition of *culture* on the chalkboard: the knowledge, beliefs, customs, and traditions shared by a group of people.

Ask students to give examples of beliefs, customs, and traditions.

Discuss with students:
- Why have these traditions and customs survived? (Culture is learned and passed from generation to generation.)
- What customs have your parents, aunts, uncles, and grandparents passed on to you?
- What customs and traditions do you want to pass on to your children?
- How did these customs and traditions become part of your family's traditions? Where did they originate?
- What special occasions does your family celebrate?
- How does your family celebrate birthdays?
- What foods do you associate with the Fourth of July?
- How do you celebrate Halloween? What foods do you associate with Halloween?
- What foods do you associate with Thanksgiving?
- What foods do you associate with Christmas, Chanukah, or other winter holidays?
- What foods do you associate with weddings?
- What school customs and traditions have been passed on to us from previous classes?

Instruct students to write an essay about ways that their families celebrate special occasions and holidays, including details about foods, decorations, and traditions associated with the holiday.

RESOURCES & MATERIALS

TEACHER TIPS

- **Special occasions are usually celebrated with high-calorie foods. If this does not occur often, it is not a problem. However, on special occasion days, other menus may need to consist of lower calorie meals to offset the high-calorie foods.**
- **Instruct students to identify some of the foods which may be high in calories and other meals that would offset high calories and high-fat foods eaten at the special meals.**

In advance, ask the cafeteria manager to plan and schedule a school lunch around an upcoming holiday.

ESSENTIAL ELEMENTS

Social studies. World history. Relationship between geography and history. The student shall be provided opportunities to describe the physical and cultural geographic characteristics of places studied.
Social studies. World geography. Nature of geography. The student shall be provided opportunities to identify specialized fields of geography (e.g., physical, cultural, political, economic, historical).

Social Studies **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Examine food traditions at home and around the world.

ASSESSMENT CRITERIA

Identify the ways that culture influences our choice of foods.

ACTIVITIES & STRATEGIES

Present the following information to the class:
As people immigrate to the United States and as Americans visit other countries, they are influenced by new and different foods and food traditions. Special occasions and festivals are ways to pass customs and culture on to children, and food is often associated with these occasions and traditions. Special table settings and decorations can add to the festivity.

Distribute the handout, "Traditional Foods for Holidays and Festivals."

Ask different students to present the information about the different holidays and festivals to the class. Discuss any other holidays that students celebrate at their homes.

Discuss how merchants and food suppliers meet the needs of different ethnic groups.

Since some holiday meals are high in calories, care should be taken to reduce fat intake and portion sizes in the remaining meals. Some low-fat, low-calorie desserts could include angel food cake and fruit. Give other examples of low-fat and low-calorie foods or meals that can balance the high-fat and high-calorie holiday meals.

Divide the class into small groups. Instruct each group to plan a meal based on a holiday chosen from the handout, "Traditional Foods for Holidays and Festivals."

After completion, ask each group to describe their meal to the class.

RESOURCES & MATERIALS

Handout: "Traditional Foods for Holidays and Festivals"

Child Nutrition and Health by Bobbie Hutchins. Gregg Division, McGraw-Hill Book Company, Dallas, Texas, 1979

The Cooking of China by Emily Hahn. Time-Life Books, New York, New York, 1968

TEACHER TIP

Ask students about other holidays that they celebrate.

In advance, check with the cafeteria manager to see if a menu or a food from the menus developed by the students could be added to the school lunch menu.

ESSENTIAL ELEMENT

Social studies. World geography. Nature of geography. The student shall be provided opportunities to identify specialized fields of geography (e.g., physical, cultural, political, economic, historical).

Traditional Foods for Holidays and Festivals

Holiday	Month	Event	Traditional Foods
Chamise Oser b'Sh'vat	January	Festival of the trees (Arbor Day); blossoming time of trees in Palestine	Bosker (St. John's bread), fruits, nuts, raisins, cakes
Chinese New Year	Falls between January 20 and February 20	Family members go home to dwelling place of head of family; ceremonies; gift giving; all family quarrels made up; all bills should be paid	Snacks, sweets, fruits, meal: red-cooked pigs' shanks, steamed pork dumplings, crisp pork cracklings, roast suckling pig, and red-cooked carp with a number of vegetables
Christmas	December 25	Celebrates Jesus Christ's birth	Varies around the world. In U.S.: turkey or ham, rich pastries, heavy meal with several courses
Cinco De Mayo	May 5	Mexican Independence	Tortillas, tacos, enchiladas, tamales, chili con queso, guacamole, rice, and pinto beans
Easter	March or April	Celebrates resurrection of Jesus Christ	Varies in different countries; colored eggs, ham or turkey, vegetables, salads, desserts, hot cross buns
Chanukah or Hanukkah	December	Feast of Lights; celebrates heroic battle of the Macabees for Jewish independence (165 B.C.)	Grated potato latkes (pancakes); potato kugel (pudding)
Id-al-Fitr	Immediately after Ramadan	Festival and feast	Chicken or veal with eggplant and onions, Kharuf manshi (whole lamb stuffed with dried fruits and cracked wheat), rich pastries
Japanese Moon Festival	Harvest time - approximately September	Parties held outdoors; moon-viewing; decorate with paper lanterns; messages placed in small cakes which started a rebellion; caused a government overthrow	Moon cakes made of flour, lard, spices, eggs, orange peel, citron, almonds, nuts, and fruits
Kwanza	December 26 - for 7 days	Honoring ancestors, assessment of the old year and commitments for the new year	Ham-bone soup, turnip greens, pinto beans, fried catfish, black-eyed peas, and corn bread
Lent	Forty week days before Easter	Fasting and repentance	Hot cross buns, avoidance of meat; light meal pattern
Ramadan	Ninth month of Islamic lunar calendar; rotates through all U.S. seasons	Month of fasting and prayer	No food or drink from dawn to sunset; feasts in evening; dates, quamar-el-deen (apricot drink), thin pancakes with powdered sugar, buns, dried fruits
Rosh Hashanah (New Year)	September or October	Beginning of Jewish New Year	Honey, honey cakes, carrot tzimmes (carrots, sweet potatoes, and pineapple baked in casserole)
Santa Lucia Day	Beginning of Christmas Season	Oldest child wears headband lined with candles; serves food to family	Special pastry

LESSON OBJECTIVE

Discuss factors affecting the world food supply.

ASSESSMENT CRITERIA

Describe the food chain and how it affects the world food supply.

Social Studies **High School**

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Define the food chain and discuss the food chain levels. ***Food chain*** is the system in which matter and energy are transferred from organism to organism in the form of food. Plants make up the base of the food chain. Plants are known as the primary food source. The food chain has five levels:
- Seeds are planted.
- Plants grow.
- Animals eat plants.
- People eat animals and plants.
- Food supplies people with nourishment and energy to plant more seeds.

Food chains often form what is known as a food web which is a result of organisms eating more than one type of plant or animal. A ***food web*** is the linkage of organisms to one another by their dependence on each other for food. Food is a product of worldwide trade. The amount of food that can be produced is affected by economic, political, technological, and environmental factors.

Discuss how ***developed countries*** and ***developing countries*** are affected by the economic, political, technological, and environmental factors.

The food chain is important to the United States economy because the United States is considered a worldwide leader in food production. Many countries depend on the United States to supplement food supplies for their populations.

Discuss these questions with the students.
Imagine that you are an ambassador to the United Nations from one of the developing countries.
- What would be your country's greatest needs?
- What kinds of aid would you ask for from developed nations?
- If your country was given food aid, what problems might you encounter in assuring that the food supplies reached the hungry citizens in your nation?

Discuss the steps in the food system (listed in the opposite column) as they relate to the developed countries and the developing countries.

RESOURCES & MATERIALS

The steps in the food system are:
- crop production
- harvesting
- transporting and storage
- product marketing
- processing and packaging
- wholesale distribution
- supermarket
- food preparation

ESSENTIAL ELEMENT

Social studies. Economics. American economic system and international economics relations. The student shall be provided opportunities to examine the purposes, the extent, and the impact of world trade on the United States' economy.

LESSON OBJECTIVE

Discuss factors affecting the world food supply.

ASSESSMENT CRITERIA

Determine how the physical, environmental, and economic conditions affect our choice of food.

ACTIVITIES & STRATEGIES

Part 1 of a two-part lesson (world food supply)

Instruct students to prepare an individual or group research report on one or more countries to be studied.

Tell students to include the following factors in their reports:
- geographical location and physical environment
- population
- climatic conditions and seasons
- crops grown; other types of food or products produced
- education of the people
- types of diet or meal patterns
- the country's exporting and importing policies
- the production and consumption ratio of food
- the importance of imported foods for the country's population
- the effect on people's diet if imports can not be received
- possibility of exports to the U.S. or other countries
- the country's economic conditions
- the political structure
- the price of goods exported to the U.S.

After the research and the written reports are completed, tell each student or group of students to give a brief oral report to the class.

Tell the class to fill in the worksheet, "Physical and Human Geography Research Chart," as each report is presented to the class.

RESOURCES & MATERIALS

Worksheet: "Physical and Human Geography Research Chart"

World map
Library resources
Encyclopedia
Textbooks

TEACHER TIP

This lesson could take one or two class periods to complete depending on the size of the class and the number of countries researched.

In advance, ask the cafeteria manager to explain commodity foods to the class to enrich Part 2 of this lesson.

ESSENTIAL ELEMENTS

Social studies. World history. Relationships between geography and history. The student shall be provided opportunities to understand the effects of the physical environment on the history of cultures and societies.
Social studies. World geography. Interaction of physical and cultural environments. The student shall be provided opportunities to explain the economic importance of water, energy sources, and other productive resources to regions.

NAME ______________________ **DATE** ______________

Physical and Human Geography Research Chart

Name of country	
Terrain and types of soil	
Climates and seasons	
Agricultural products	
Other industries	
Education	
Types of diet	
Exports	
Imports	
Economic conditions	
Political structure	

LESSON OBJECTIVE

Discuss factors affecting the world food supply.

ASSESSMENT CRITERIA

Describe factors related to the supply of food needed to meet the nutritional needs of the world's population.

Social Studies High School

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Part 2 of a two-part lesson (world food supply)

Ask students to review the worksheet: "Physical and Human Geography Research Chart."

Have the following questions written on 3x5 cards and give one to each student, or tape the cards to certain chairs. Tell students to research, report, and discuss the following:

1. Explain how the geographical factors affect the world food supply.
2. Which factors would have the greatest effect on the country's food supply?
3. Would the country have enough food to supply the people? Would food need to be imported? Would the country have food to export to other needy countries?
4. What determines the country's ability to import or export products?
5. Considering the present conditions, what would be the effect on Russia if they could not receive imported grain from the United States?
6. How have the export products from the United States affected the diets of people in other countries such as India, Mexico, and Japan?
7. What food products does the United States export?
8. What products do other countries import to the United States?
9. What are commodity foods? What commodity foods are served in the cafeteria? How does this help the producers of these foods?
10. Palm oil is a food which is imported to the United States from some of the Asian countries. What dietary effect could this oil have on the diets of the people in this country?

RESOURCES & MATERIALS

Worksheet: "Physical and Human Geography Research Chart" from Part 1

Current news magazines and newspapers

ANSWERS TO DISCUSSION QUESTIONS

1. Check the worksheet; answers will vary with the country. Possible answers: poor soil, too mountainous, too little or too much rain, lack of equipment.

2.&3. Answers will vary; check answers on chart.

4. If the country has free trade; if a tariff was added on some products by a country; if there was a quota or other trade barriers.

5. Russia's staple diet foods are made of grain; climatic conditions prevent growing of some grains; production does not meet consumption needs; economy does not allow for paying for exports; need for government aid; empty stomachs cause unrest.

6. Grains would help prevent malnutrition or hunger in India and other developing countries; meat provides more protein in Japan where school seats have had to be elevated because of increase in height due to more protein in the diet.

7. One-third of America's crop output is exported at the present time; exports include wheat, corn, sorghum, soybeans, soybean meal, soybean oil, rice, cotton, and meat.

8. Some examples of food products imported to the U.S. are coffee, tea, cocoa, bananas, and spices.

9. Commodity foods: surplus food products that are stored as a result of farm price support programs. Check with the district's director of food service.

10. Palm oil is a saturated fat. Even though it is derived from plants, it could cause an excess of cholesterol in the bloodstream and possible heart problems.

ESSENTIAL ELEMENTS

Social studies. World history. Relationships between geography and history. The student shall be provided opportunities to understand the effects of the physical environment on the history of cultures and societies.

Social studies. World geography. Interaction of physical and cultural environments. The student shall be provided opportunities to explain the economic importance of water, energy sources, and other productive resources to regions.

LESSON OBJECTIVE

Discuss factors affecting the world food supply.

ASSESSMENT CRITERIA

Analyze factors related to the supply of food to meet the nutritional needs of the world's population.

Social Studies High School

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Lead a class discussion regarding the factors related to the supply of food to meet the nutritional needs of the world's population. Use the mind-mapping technique to diagram the factors and the issues and/or problems associated with each factor. Refer to the teacher resource, "The World Food Supply," to begin the activity. Some factors are:

- political
- educational
- economical
- technological
- social and cultural
- ecological

Direct the students to brainstorm and list issues affecting the world food supply that are associated with these six factors. A student volunteer could complete the diagram on the chalkboard as other students verbalize their brainstorming ideas, or ask each student to do the mind-mapping exercise on a blank sheet of paper.

Encourage students to discuss the cause and effect relationship of the factors and issues involved by asking the following key questions:

- In what ways are people responsible for the current status of the world food supply?
- How can *developed countries* assist *developing countries* with solutions to food supply problems?
- How are the quantity and quality of the food supply affected by climate and soil conditions?
- Are the governments of countries around the world part of the food supply problems, or are they part of the solutions? Why? List reasons to justify your response.
- Which of the factors are currently addressed through actions of private or public organizations?
- Which world food supply problems will require the cooperation of many nations?
- Which of the factors involve the United States?

RESOURCES & MATERIALS

Teacher Resource: "The World Food Supply"

Social studies textbooks
Encyclopedias
Other resource material

Definitions:

- Developed countries - industrialized nations with food production and supply which can provide a sufficient standard of living for its citizens.
- Developing countries - nations that are working to become more industrialized as well as nations with severe economic problems.

ESSENTIAL ELEMENT

Social studies. World geography. Interaction of physical and cultural environments. The student shall be provided opportunities to describe the interrelationships of people and their environments.

The World Food Supply

Political Factors
- Political Climate (Unrest, hunger, and poverty not a priority)
- Government regulations
- Political figures exclude themselves from exposure to problems in their country

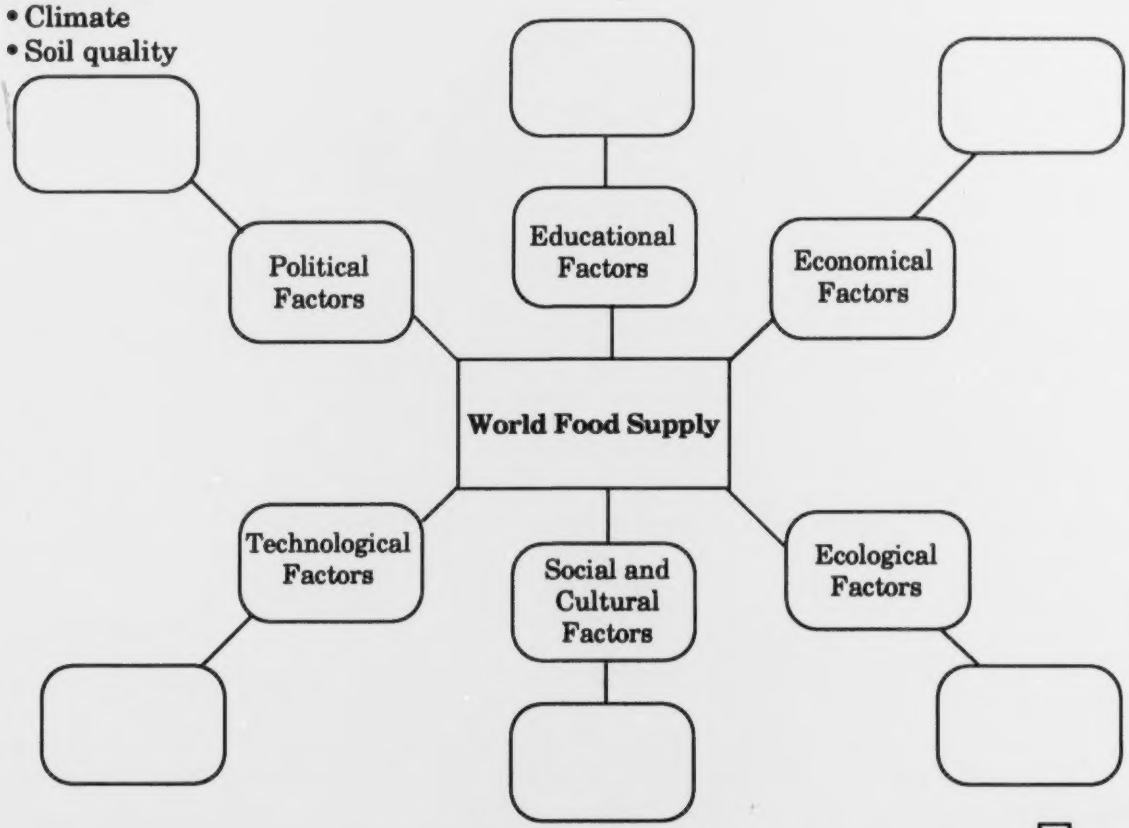
Economical Factors
- Poverty
- Land ownership and tenure relationships
- Lack of funds to purchase farm equipment
- Lack of funds to purchase nourishing food

Social and Cultural Factors
- Traditional value systems
- Customs
- Superstitions
- Societal and cultural food patterns

Ecological Factors
- Disasters
- Climate
- Soil quality

Educational Factors
- Need for nutrition education
- Lack of agricultural education
- Illiteracy

Technological Factors
- Postharvest technology
- Industrialization
- Need for increased food production
- Transportation facilities
- Storage facilities
- Food reserves
- Agricultural capabilities
- Green revolution
- Marketing
- Biotechnology
- Genetic engineering
- Aquaculture


Political Factors
Educational Factors
Economical Factors
World Food Supply
Technological Factors
Social and Cultural Factors
Ecological Factors

Social Studies High School

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Discuss factors affecting the world food supply.

ASSESSMENT CRITERIA

- Describe developing countries and developed countries.
- Identify solutions for world hunger.

ACTIVITIES & STRATEGIES

Discuss with the class that the provision of food for the world's population continues to plague the leaders of both the poor and the rich countries.

Write the following words on the chalkboard and discuss the definitions with the students: (Definitions are in the opposite column.)
- Dietary mainstay
- Developed countries
- Developing countries

Divide the class in half. Tell one group to list the nations which would be considered as developed countries. (Include countries such as the United States, Canada, Russia, Japan, Australia, and New Zealand). Tell the other group to list the developing countries. (Include Kenya, India, and El Salvador.) Ask a spokesperson from each group to report the list of countries and reasons for choosing these countries to the class.

Discuss advertisements that students have seen on TV, in newspapers, or magazines which made them aware of world hunger (Example: "Save the Children"). Ask students to share their feelings towards the children, their families, and the country. (Example: apathy, sympathy, thankfulness for what they have, disbelief, and anger) Determine if any of the students' families are participating in this or a similar organization.

Discuss the meaning of World Hunger Day. Ask students who have participated to share their experiences with the class. Ask for suggestions on ways the class can participate in World Hunger Day.

Discuss ways which the United States is involved in the humanitarian efforts towards world hunger. Instruct each student to write a paragraph about what they think the United States' role is in helping prevent world hunger.

RESOURCES & MATERIALS

Advanced Food Science and Nutrition. Home Economics Curriculum Center, Texas Tech University, P.O. Box 41161, Lubbock, Texas 79409-1161, (806) 742-3029

Articles and pictures about world hunger from newspapers and magazines

Definitions:
- Dietary mainstay - foods that provide the main nourishment and are the most available in an area.
- Developed countries - industrialized nations with food production and supply which can provide a sufficient standard of living for its citizens.
- Developing countries - nations that are working to become more industrialized as well as nations with severe economic problems.

TEACHER TIP

When information is presented concerning world hunger, students should not be left with a sense of hopelessness.

ESSENTIAL ELEMENT

Social studies. United States history. Emergence of the United States as a world power. The student shall be provided opportunities to describe the causes and effects of United States involvement in foreign affairs, international conflicts, and international cooperative efforts (political, humanitarian, economic, and military).

Social Studies **High School**

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Discuss factors affecting the world food supply.

ASSESSMENT CRITERIA

Describe new ways in which developing countries could become more independent.

ACTIVITIES & STRATEGIES

Assign students to research these new developments in food trends, and then report their findings to the class.

- agribusiness
- genetic engineering
- recombinant DNA
- cell fusion
- hybrids
- polyculture
- aquaculture
- hydroponics

Discuss which countries are considered:

- developed
- developing

Ask the students to choose and research one of the countries regarding food production, economics, geographical area, hunger, and politics. Could any of the developments in food production be applicable to that country?

Ask each student to report to the class and let the class discuss the following:

- Determine a way to best help the people in this country.
- Organize the procedure you would follow.
- With which political leaders would you have to communicate?
- What plans would you give these political leaders?
- What other problems might you encounter?
- How could you evaluate the success of this project?
- Since the above project could not be completed with another country, could it be completed with a group of people in your own community?

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Advanced Food Science and Nutrition. Home Economics Curriculum Center, Texas Tech University, P.O. Box 41161, Lubbock, Texas 79409-1161 (806) 742-3029

Reference books
World map

ESSENTIAL ELEMENT

Social studies. Economics. American economic system and international economics relations. The student shall be provided opportunities to examine the purposes, the extent, and the impact of world trade on the United States' economy.

LESSON OBJECTIVE

Investigate new developments in food trends.

ASSESSMENT CRITERIA

Recognize the necessity of new developments in food trends.

Social Studies **High School**

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Discuss the definition of formulated foods.

Formulated foods are food products developed to supplement diets and feeding programs for people who are malnourished or suffering from some nutritional deficiency. It also includes foods that combine nutrients into the exact proportions needed by a certain group of people such as formulas for feeding babies.

Discuss these recent developments in food trends.
- ***Incaparina***: a mixture of corn and cottonseed flour used as part of a supplemental feeding program in Central America and Panama.
- ***Bennimix:*** a protein-rich flour developed in Sierra Leone in West Africa to supplement the diets of infants and children. It is made from rice and benniseed (a variety of sesame seed and peanuts). Malnourished children thrive when it is added to their diets.
- ***Nepal***: a mixture of soybeans, corn, and wheat. This *superflour*, used to make a porridge, is fed to malnourished children and their mothers. After supplementing their diets for ten days, young and old gain weight and their overall health improves.

Meat analogues or meat replacements are food products made from plant proteins that have been shaped and formed to resemble meat products. An example is ***tofu***. The advantages are low-fat content and lower cost.

Synthetic foods are manufactured food products which are made from artificial chemicals that resemble those naturally found in foods. Examples are soy milk for infant formulas and vitamin tablets. Advantages of these synthetic foods are:
- longer shelf life
- lower cost
- unlimited availability to consumers

Instruct students to study the critical thinking questions in the opposite column and write several paragraphs on each question.

RESOURCES & MATERIALS

"Appendix G: Glossary of Terms"

Critical thinking questions:
Futurists forecast American lifestyles in the twenty-first century to be fast-paced, career-oriented, and family-centered. Although both parents will be employed in most families, scheduling time for family activities will be a priority.
- What challenges does this lifestyle offer the food industry?
- What problems will arise for the food industry as consumer demands increase in the next twenty years?
- What new food trends do you predict will develop in the next twenty years?

ESSENTIAL ELEMENT

Social studies. Economics. American economic system and international economic relations. The student shall be provided opportunities to examine the purposes, the extent, and the impact of world trade on the United States economy.

Social Studies **High School**

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Investigate claims concerning natural and organic foods.

ASSESSMENT CRITERIA

Distinguish between organic and natural foods.

ACTIVITIES & STRATEGIES

Define and discuss the following terms:
- *Organic food*: a food fertilized with natural organic matter (manure), grown without application of pesticides, and processed without the use of additives.
- *Natural food*: a food altered as little as possible from the original farm-grown state.

Distribute and review the worksheet, "Food: Organic or Natural."

Assign students to research information on organic foods, natural foods, and health food stores in the school library and complete the chart on the worksheet.

Instruct the students to formulate their concerns and suggestions based on their research and to be prepared to respond to the double circle discussion questions.

Prepare for a double circle discussion:
- Form chairs or desks into a double discussion circle.
- Select or ask for volunteers to be in the inner circle to start the discussion. The remaining students will be in the outer circle.
- Present the questions on the worksheet and any other questions for a designated time limit.
- After students in the inner circle have responded, a student in the outer circle may tap a student on the shoulder and the two students would exchange places. All students in the outer circle should transfer to the inner circle to participate in the discussion. Students may exchange chairs as soon as a person responds.

During the discussion, include the advantages and disadvantages of natural foods found in the opposite column.

RESOURCES & MATERIALS

Worksheet: "Food: Organic or Natural"

"Fact Sheet, Understanding Organic/Natural Foods," Texas Agricultural Extension Service

Advantages and disadvantages of natural foods:
Advantages:
- free of pesticides and chemicals
- psychological benefit to some people

Disadvantages:
- currently no federal regulations
- labels on organic/natural food may not be true
- high prices
- people postponing medical advice because they believe a health food can cure them

TEACHER TIP

Conduct a tour of a health food store, or purchase food from a grocery store and a health food store; compare labels and taste the product.

ESSENTIAL ELEMENT

Social studies. Economics. American free enterprise system. The student shall be provided opportunities to analyze how supply and demand affect prices.

NAME ______________________________ DATE ____________________

Food: Organic or Natural

Complete the following chart as you do the research assigned in the lesson.

Information	Organic Food	Natural Food
Definition		
Various view points		
Value of the food		
Dangers of the food		
Availability of food		
Cost of the food		
Which foods are available at health food stores		

Questions for Double Circle Discussion

1. It is against the law in Texas, but in countries and islands where it is lawful to use organic fertilizers of animal or human origin, what special problems do they have?
2. What problems would this cause when these foods are imported to the United States?
3. How can the pesticide residue be determined, and what is the difference in pesticide residues of organically grown food and natural foods?
4. What are the advantages and disadvantages of health food stores? What foods would they have that regular grocery stores would not have? What group of people would most benefit from a health food store?
5. Describe the effects on the food supply in the United States if fertilizer was prohibited.
6. Discuss the effects on the food supply in the United States if pesticides were prohibited.
7. Evaluate the results of using pesticides and fertilizers in relation to the world food supply.

LESSON OBJECTIVE

Analyze the factors involved in preventing food-borne illness.

ASSESSMENT CRITERIA

Analyze how food storage affects seafood quality.

Vocational Education

High School

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Part 1 of a three-part lesson (fish)

Discuss the types of fish available in your area. What types of stores purchase fish in your area?

Present the information in the opposite column.

Divide the class into three groups, and assign each group to perform the following experiment.

- Put one piece of fish in a regular freezer bag and freeze.
- Put one piece of fish in a bag with carbon dioxide and freeze.
- Put one piece of fish in a vacuum-packed freezer bag and freeze. If a vacuum sealer is not available at your school, you could probably have a home economist with an appliance company loan you a vacuum sealer or prepare the product for you.
- Observe each container daily for one week. Evaluate, draw conclusions on appearance, and summarize in writing.
- Thaw the three samples, but keep them packed in ice for three days to one week. Observe and summarize your observations in writing.

RESOURCES & MATERIALS

1 fresh fish or 3 fish fillets
3 plastic freezer bags
Vacuum style food sealer
Dry ice (obtain from an ice company or a milk and ice cream manufacturer)

Texas Agricultural Extension Service, Seafood Division, Port Aransas, Texas

Teacher information:
The deterioration of quality and the length of shelf-life of fish depend on a number of factors:

- microbiological conditions
  - the initial number of bacteria
  - the temperature of the product
  - the type of bacteria
- autolytic processes which break down cells through biochemical means
- chemical changes, such as oxidation (rancidity)
- the type of packaging and the difference in the air
  - Air packaging supports the pseudomonas species of spoilage organism.
  - Carbon dioxide slows spoilage but also affects the texture of the fish.
  - Vacuum packaging causes slower growing lactics to become dominant and shelf-life increases.

The above conditions are dependent on various factors which will be discussed in part 2 of a three-part lesson.

ESSENTIAL ELEMENT

Vocational and applied technology education. Advanced food science and nutrition. Concepts and skills related to food processing and marketing. The student shall be provided opportunities to analyze the impact of processing on product quality, nutrition, and taste.

LESSON OBJECTIVE

Analyze the factors involved in preventing food-borne illness.

ASSESSMENT CRITERIA

Demonstrate the effects on food when it is not kept at the correct temperature.

ACTIVITIES & STRATEGIES

Part 2 of a three-part lesson (fish)

Discuss the written observations students made about the fish prepared in Part 1 of this lesson.

Review the material on deterioration of quality and length of shelf-life discussed in Part 1.

The factors concerning spoilage that were discussed yesterday are also based upon the following information:
- the species of fish
- whether the product was harvested from warm or cool water
- the level of fat in the fish
- whether the fish was feeding when captured
  - If Atlantic bluefish was harvested while feeding, the digestive enzymes in the gut can begin digesting the stomach wall within a few hours. This is called belly burn.
- Bacteria can quickly digest the large quantities of compounds which fish contain.
- Lack of connective tissue in fish allows bacteria to attack and digest the fish more quickly than it would in beef.

Complete the following experiment:
- Allow one container of oysters to remain at room temperature over night or for a few hours.
- Allow one container of oysters to remain in the refrigerator.
- At the beginning of class, separate the liquid and the oysters. Be sure to keep warm liquid with warm oysters.
- Allow students to observe the appearance of the oysters and smell the liquid. The liquid left at room temperature will be cloudy and have an ammonia smell. Tell students to summarize their observations in writing.

RESOURCES & MATERIALS

Texas Agricultural Extension Service, Seafood Division, Port Aransas, Texas

2 containers of oysters
2 bowls
2 jars

ESSENTIAL ELEMENT

Vocational and applied technology education. Advanced food science and nutrition. Concepts and skills related to food processing and marketing. The student shall be provided opportunities to outline safety and sanitation considerations for food processing and packaging.

Vocational Education **High School**

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVES

- Compare the nutritive value of foods.
- Discuss wise consumer food-buying skills.

ASSESSMENT CRITERIA

- Recognize the importance of being informed when purchasing fish.
- Identify the nutrients found in fish.

ACTIVITIES & STRATEGIES

Part 3 of a three-part lesson (fish)

Discuss the following information with the students:

- The purchasing place for fish should have no fish odors and the fish should be packed in ice in a refrigerated case.
- Fish cannot always be identified by appearance or taste. Cheaper fish is sometimes substituted for the more expensive fish; select a trusted seafood salesperson.
- Identifying the species of skin-off fillets is difficult without a chemical analysis. Skinned cod and haddock fillets look so similar that they appear to be cut from the same fish.
- Haddock is more expensive than cod, so New England fishermen have started leaving the skin on haddock so consumers can recognize the fish quickly.
- Red snapper should also be purchased with the skin on. Less expensive snappers are sometimes substituted.

Present the information in the opposite column about the nutrients found in fish.

Perform the following experiment:

- Label the two different types of white fish as *A* and *B* . Tell the students the names of the fish, but do not identify them as *A* or *B*.
- Use two electric skillets. Spray the skillets with nonstick spray.
- Cook only until tender; fish will flake when pierced with a fork when cooked.
- Serve small pieces on a plate and provide plastic forks.

Instruct students to taste and write the names:

- Name of fish *A*____________
- Name of fish *B*____________

Discuss this tasting experience and the difficulty in identifying some types of fish without a chemical analysis.

RESOURCES & MATERIALS

Texas Agricultural Extension Service, Seafood Division, Port Aransas, Texas

2 different types of white fish
2 electric skillets
Small plastic plates and forks

Teacher information:
(Nutrients will vary with the type of fish.)

- Fish oils contain vitamins A and D; white fish do not contain vitamin A or D.
- Canned salmon and sardines provide calcium because they are packed with bones still in the fish.
- Salmon, herring, and sardines contain variable amounts of vitamin D.
- Fish in general contain thiamin, niacin, B_6 (pyridoxine), B_{12} (cyanocobalamin), pantothenic acid, and folic acid.
- Marine fish and shellfish are reliable sources of iodine and selenium.
- Fish contain significant amounts of fluoride.
- Fish is a rich source of potassium.
- Fish is low in sodium unless it is smoked or dried.
- Fish is low in cholesterol, fat, and calories.
- Fatty fish contains omega-3 fatty acids which have shown to decrease blood levels of fatty triglycerides and cholesterol.

ESSENTIAL ELEMENT

Vocational and applied technology education. Advanced food science and nutrition. Concepts and skills related to food processing and marketing. The student shall be provided opportunities to summarize the scientific and creative aspects of food processing and marketing.

Vocational Education

High School

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Discuss the Dietary Guidelines for Americans.

ASSESSMENT CRITERIA

- Analyze the Dietary Guidelines for Americans.
- Apply the Dietary Guidelines for Americans to a day's menu.

ACTIVITIES & STRATEGIES

Distribute copies of "Appendix C: A Pattern for Daily Food Choices" and "Appendix F: Dietary Guidelines for Americans."

Divide the class into six or seven groups depending on class size.

Briefly review each appendix with the class.

Instruct the students to study Appendix C and Appendix F as a group and complete the following activities:
- Plan a day's menu and apply the guidelines in Appendix C and Appendix F.
- Select one meal from the day's menu to prepare in the lab. Check with the teacher after selecting the meal.
- Plan a market list for the meal to be prepared.
- Plan a laboratory worksheet including duties and time schedule.
- Prepare the meal in the foods laboratory and serve the meal to the group.

Instruct the class to evaluate each meal according to the Pattern for Daily Food Choices and the Dietary Guidelines for Americans.

RESOURCES & MATERIALS

"Appendix C: A Pattern for Daily Food Choices"

"Appendix F: Dietary Guidelines for Americans"

"Heart Challenges," American Heart Association Schoolsite Program, High School

"Culinary Hearts Kitchen," American Heart Association

The classroom teacher's laboratory plan sheet
The classroom teacher's market order sheet
Groceries for meal preparation

TEACHER TIP

This lesson could take 2 to 5 days depending on the length of each class period and the complexity of the food to be prepared.

ESSENTIAL ELEMENT

Vocational and applied technology education. Comprehensive home economics. Concepts and skills for managing food and nutrition for families and individuals. The student shall be provided opportunities to analyze basic nutrition needs and results of dietary practices.

LESSON OBJECTIVE

Analyze the relationship between nutrition, health, and wellness.

ASSESSMENT CRITERIA

- Summarize the nutritional changes of an older adult.
- Apply nutritional choices in planning a meal.

ACTIVITIES & STRATEGIES

Good nutrition is necessary to the quality of life, but it cannot prevent aging.

Present the following information:
Our bodies can use the natural and synthetic forms of vitamins and minerals equally well. However, we receive a number of nutrients from foods which work together to improve nutrition and health. An elderly person living alone sometimes does not eat correctly because of the difficulty in buying groceries and preparing meals. Use the transparency, "Marketing Suggestions for the Elderly," to discuss ways to help the elderly with their marketing and storage in order to make meal preparation easier.

Discuss additional nutrition and health facts for the elderly listed in the opposite column.

Most elderly people would need to include at least the minimum number of servings listed in "Appendix C: A Pattern for Daily Food Choices."

Divide the class into groups. Assign students to plan a week's menu and grocery list for Mrs. Graham after reading about her conditions. When planning her menus, use the grocery store advertisements and remember that she is on a limited budget. A community service group can deliver her groceries only after they receive her grocery list and money.

Mrs. Graham is 78 years old and lives alone. Her children live in other states, and Mrs. Graham is no longer able to drive. She has arthritis, dentures, depression, and mild hypertension. The medication she is taking has caused her to have a loss of appetite, but she does not need to lose weight.

After all groups have completed the assignment, discuss the different menus. Examine the cost, nutritional value, preparation, and appeal of each menu.

RESOURCES & MATERIALS

Transparency: "Marketing Suggestions for the Elderly"
Transparency: "Appendix C: A Pattern for Daily Food Choices"
"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*
Grocery store advertisements
Overhead projector

Nutrition and health facts for the elderly:
- The need for calories decreases with age due to decreased physical activity and a decline in basal metabolic rate.
- Women's iron needs decrease due to menopause.
- Calcium is frequently lacking in the diet.
- Fat content should be reduced.
- Diets are often low in fiber and water, causing reduced intestinal movement of waste products.
- Use of laxatives can lead to vitamin deficiencies.
- The elderly need to prevent obesity.
- The aging process reduces one's ability to obtain nutrients from foods.
- The elderly need to remain physically active.

TEACHER TIPS
- **If the social studies department uses newspapers in class, ask the teacher to save the grocery advertisements so that there will be multiple copies.**
- **Ask the librarian to save the advertisements for your class.**

ESSENTIAL ELEMENT

Vocational and applied technology education. Food science and nutrition. Concepts and skills relating food and nutrition to special needs. The student shall be provided opportunities to propose ways persons in self care such as children, elderly, and handicapped may meet nutritional needs.

Marketing Suggestions for the Elderly

- Plan your meals, prepare a list, and shop from the grocery list.
- Buy small cans of vegetables or buy frozen vegetables in resealable bags; they may be more expensive but the extra food wouldn't be wasted .
- Buy only what you will use. If the vegetable cannot be bought individually, ask the grocer to break open a package of vegetables in order to buy a smaller amount.
- Buy three pieces of each kind of fresh fruit—a ripe one, a medium ripe and a greener one. Eat the ripe one today, let the others ripen in a wire fruit basket.
- Prepare a stew or soup from leftovers. Soup and stews can be made from a combination of meats and/or vegetables; they can be made to a thin or thick consistency.
- Think of different ways to use each vegetable so that you will not get tired of it, yet it will not ruin before using it.
- Buy fresh milk in size best suited to your needs.
- Prepare reconstituted nonfat dry milk. When served very cold, the taste is better and will be much cheaper.
- Buy a carton of six or eight eggs.
- Place dry staples such as macaroni, cereal, cornmeal, and dry beans in tightly sealed jars.
- Place each of the above jars in the freezer overnight to kill any eggs or contaminants before storing in the cabinet. They will keep for a longer period of time.
- If meat cannot be bought in single servings, prepare packaged meats in serving size portions in heavy, tightly closed freezer bags.
- Store several small freezer bags in one larger plastic bag so the smaller packages do not get lost in the freezer.
- Prepare a casserole recipe and divide into smaller servings; freeze for future use.
- Eat out with friends at least once a week.
- Invite friends to dine with you. Use the special china and eat by candlelight.

LESSON OBJECTIVE

Analyze the relationship between nutrition, health, and wellness.

ASSESSMENT CRITERIA

Demonstrate experience in meal planning based on "A Pattern for Daily Food Choices."

ACTIVITIES & STRATEGIES

Discuss "Appendix C: A Pattern for Daily Food Choices."

Discuss the factors that contribute to an appealing meal.
- Flavors: flavors should harmonize; do not serve all strong or all mild vegetables in one meal.
- Shape and size: vary the size and shape of the food; do not have all long shapes or all round shapes.
- Texture: vary the texture; prepare some soft foods as well as crisp foods.
- Color: a variety of colors make a meal more interesting and appetizing.
- Temperature: hot foods should be served hot, and cold foods should be served cold. People enjoy cold foods in the summer and warm foods in the winter. However, both cold and hot foods could be served at the same meal in any season.

Arrange food models on tables or cabinets to resemble a cafeteria line.

Divide the class into groups of four. Assign a leader in each group by selecting the person whose birthday is the closest to the class date.

Give each group member a paper plate. Allow two groups to go to the assembled cafeteria line to select a balanced meal for the day (breakfast, lunch, dinner, and a snack.) Set a time limit of 10 minutes.

As each of the two groups present their selections to the class, the students will evaluate the day's meal, using the information discussed at the beginning of the class.

After the two groups complete their presentation, they will return the food models to the correct places in the assembled cafeteria for other groups to select. More than two groups could work at the same time if there are enough food models and plenty of space.

RESOURCES & MATERIALS

"Appendix C: A Pattern for Daily Food Choices"

Food Models from the National Dairy Council,
6300 N. River Road, Rosemont, Ill. 60018-4233
(708) 696-1860

Paper plates
Timer

ESSENTIAL ELEMENT

Vocational and applied technology education. Comprehensive home economics. Concepts and skills for managing food and nutrition for families and individuals. The student shall be provided opportunities to apply management techniques in planning and preparing simple meals.

LESSON OBJECTIVE

Outline methods for retaining nutrients in foods.

ASSESSMENT CRITERIA

Analyze ways that a microwave oven can provide more healthful meals.

ACTIVITIES & STRATEGIES

Introduce the following information to the students:
There are many ways a microwave oven can help people to economize.

- It is a time saver.
- The short cooking time saves on the cost of energy.
- The short cooking time retains the nutritive value of the food.
- Very little water is added, so nutrients are not absorbed in the liquid.
- The color and flavor of the vegetables are retained.
- Some frozen vegetables can be cooked in the package by cutting a large X in the container.
- Less time is required for cleanup.

Discuss the method by which foods are cooked or heated in the microwave (see "Microwave Cookery" in the resource column to the right).

Experiment by cooking broccoli by several methods:

- in a box or a bag in the microwave
- in a bowl in the microwave, as directed by instructions on the package
- in a pan with water, using a lid on the pan
- in a pan with water using no lid for the first five minutes

Develop criteria for evaluating the result of each cooking method, such as:

- retains nutrients in the food
- changes in color, texture, and flavor

After the evaluation, discuss conclusions about the methods of cooking. Instruct the students to write a summary of the conclusions that are important to them.

RESOURCES & MATERIALS

Microwave oven
Range
Small bowl
Small sauce pan with lid
Small sauce pan without lid
2 to 3 boxes of frozen broccoli spears

Microwave Cookery

Microwaves cook by using waves of energy that are the same frequency as water. The energy is transferred into the water molecules in the food causing them to move rapidly, resulting in heat from friction. The heat spreads throughout the food.

TEACHER TIP

If the class is large, select a few student-tasters to sample and describe the flavor of the products.

ESSENTIAL ELEMENT

Vocational and applied technology education. Advanced food science and nutrition. Concepts and skills related to the significance of nutrition. The student shall be provided opportunities to summarize methods for retaining nutrients in foods.

Vocational Education
High School
HS
TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Outline methods for retaining nutrients in foods.

ASSESSMENT CRITERIA

Analyze the ways that a pressure saucepan can provide healthful meals.

ACTIVITIES & STRATEGIES

Introduction to students:

- A pressure saucepan is a special pan which is lightweight, safe, easy to use, and cooks with steam under pressure.
- Cooking is done at a higher than boiling temperature of 250° F. which exists at an automatically controlled pressure of 15 pounds.
- Rapid heat penetration produces quick cooking.
- Foods such as vegetables, fruits, and cereals can be cooked in the pressure saucepan.
- Less tender and less expensive cuts of meat become as tender and tasty as the more expensive cuts of meat when cooked in the pressure saucepan.

Cooking in a pressure saucepan saves:

- nutrients
- fuel
- energy
- cleanup time

Display the transparency, "Pressure Saucepan Safety and Cooking Principles," and discuss these safety and cooking principles with the students.

If possible, have the ingredients for the recipe, Swiss Steak, ready to mix together and cook in class at the beginning of the class period. Assign one or two students to start the cooking procedure and observe the pressure regulator of the saucepan (preferably a student who uses a pressure saucepan at home). This could be cooking while the principles are being discussed.

Summarize the information in the opposite column.

Let the students sample the Swiss Steak and make comparisons to meat cooked by other methods.

RESOURCES & MATERIALS

Transparency: "Pressure Saucepan Safety and Cooking Principles"

Pressure saucepan and instruction book
Ingredients for Swiss Steak
Small cups and spoons

Teacher information:
In some cooking methods, the vitamin content of the foods, particularly vitamin C, is lost through oxidation and long cooking. In a pressure cooker, cooking is done free from air, eliminating oxidation. Foods are cooked in the shortest possible time with a small amount of water, thus retaining the nutrients. If the nutrients are lost in the storing or cooking procedure, we are not getting the most from our food dollar. If we do not receive the nutrients to keep us healthy, money will have to be spent for health care.

ESSENTIAL ELEMENT

Vocational and applied technology education. Advanced food science and nutrition. Concepts and skills related to the significance of nutrition. The student shall be provided opportunities to summarize methods for retaining nutrients in foods.

Pressure Saucepan Safety and Cooking Principles

Safety Principles

- Prepare food according to the directions.
- If cooking rack is used, always use 1/2 cup of water in the 4-quart cooker and one cup when using a 6-quart cooker.
- Study direction book to learn about the pressure regulator; when to start counting time.
- Observe the pressure saucepan while the pressure is building and until flame or electric element has been adjusted and the pressure stays constant.
- Do not fill more than two-thirds full.
- Study instruction book to see proper procedure for cooling.
- Never remove the pressure regulator until the pressure is down.
- Remove the pressure regulator before removing the cover.

Cooking Principles

More nutrients are saved by cooking in a pressure cooker than in many other types of saucepans. The reasons for the retention of nutrients are listed below.

- Only enough water is used to create steam for pressure.
- This usually amounts to only 1/2 cup, depending on the amount of food and the size of the cooker.
- Vegetables are placed on a rack out of contact with water; therefore nutrients are not soaked out of the vegetables.
- There is no possibility for oxidation of certain vitamins since all air is exhausted from the cooker and food cooks in a pure steam atmosphere.
- The short cooking time protects vitamins from over-exposure to heat.
- Flavor of the food is saved due to short cooking in an airless medium that inhibits the chemical activity of sulphur compounds which causes unpleasant odors and flavors in strong-flavored vegetables such as cabbage, cauliflower, and turnips; a fresher, sweeter-flavored food results.
- Natural mineral salts are retained resulting in mild-flavored vegetables that taste sweeter without any sugar added.
- Speedy pressure cooking does not allow for color fading which results from chemical decomposition of unstable coloring pigments in vegetables.

Recipe for Swiss Steak

1/2 to 1 inch thick round steak
Flour, salt, and pepper
2 tbsp. vegetable oil
1 medium onion, diced
1 cup diced celery
1 medium green pepper, diced
1 cup of tomato soup or 1 - 303 can of canned tomatoes (2 cups)
1/4 cup water
1 tsp. cornstarch

Directions for preparing:
Cut meat into serving pieces. Season with salt and pepper and roll in flour. Heat cooker; add fat. Sear meat golden brown on both sides. Add onion, celery, pepper, tomato soup or canned tomatoes, and water. Close cover securely. Place pressure regulator on vent pipe and cook 15 minutes at 15 pounds. Let pressure drop of its own accord. If desired, thicken gravy with corn starch. Serves 5 to 6.

Hints:

- If time is limited, the meat does not have to be seared; just add meat and vegetables, thus omitting fat.
- If time is limited, the cooker may be cooled under the faucet; however, read the instruction book or observe a demonstration of this procedure.

LESSON OBJECTIVE

Make wise food choices at snack time.

ASSESSMENT CRITERIA

Distinguish between nutritious snack foods and empty-calorie snack foods.

ACTIVITIES & STRATEGIES

Assign each student to bring a favorite snack food to class and/or provide examples of snack foods with RDA percentages shown on labels.

Analyze and discuss the snack food contributions to the diet.

Explain the following to the students:
- Snacks can contribute food value to the daily diet, but need to be eaten as part of a balanced diet.
- "Appendix C: A Pattern for Daily Food Choices" can help to develop a snacking plan which can contribute to a better diet.

Define and give examples of empty-calorie snacks. Foods such as soft drinks, candy bars, and chips satisfy hunger, but have little nutritional value.

Distribute the worksheet, "Make Your Munchies Count." Tell the students to complete the worksheet and prepare a chart on the back of the worksheet, following the example in "Appendix E: Food Composition Table."

Ask the students to list the foods chosen on the worksheet and determine the total daily nutrients received during their busy day. Compare the totals to the requirements in "Appendix D: Recommended Dietary Allowances." If some foods are not listed in Appendix D, tell the students to refer to the Food Composition Tables in the back of their textbooks.

When the charts are completed, ask the students to share the information about their snack foods with the class.

RESOURCES & MATERIALS

Worksheet: "Make Your Munchies Count"

Handout: "Appendix C: A Pattern for Daily Food Choices"

Handout: "Appendix D: Recommended Dietary Allowances"

Handout: "Appendix E: Food Composition Table"

Food science and nutrition textbooks

TEACHER TIP

The teacher could prepare a chart with the nutrients as shown in Appendix E: Food Composition Table and distribute a copy to the students for their calculations.

ESSENTIAL ELEMENT

Vocational and applied technology education. Food science and nutrition. Concepts and skills related to nutrition. The student shall be provided opportunities to relate food intake to individual and family health.

NAME ______________________________ DATE ________________

MAKE YOUR MUNCHIES COUNT

Some people are super snackers; they snack all day long. Put yourself in one super snacker's place for a day. Nibbling throughout the day can supply 100 percent of the RDAs, if you plan ahead. How close can you come to meeting your body's nutritional needs without eating any regular meals? Read the situations below and write down your snack choices. Look up the nutritive values of the snacks you chose, and compare them with the established Recommended Dietary Allowances. How well do your munchies match up to the RDAs?

1. You overslept again! Do you grab an orange as you race out the door or a chocolate almond candy bar from the vending machine at school?

2. It is 10 a.m. and you are in a slump. You feel that you need a pickup between classes. As you walk by the vending machine, do you stop to purchase a package of sunflower seeds or a bag of potato chips?

3. You are experimenting with snacks in the food lab just before lunch. Do you sample the home-baked bran cereal muffins or the chocolate chip cookies your class has made?

4. You must squeeze in a quick 10-minute lunch in order to make it to the club meeting on time. You can grab a corn dog, a tuna salad sandwich, raisin-carrot salad, French fries, milk, or a soft drink. Which choices do you make?

5. At mid-afternoon break, you run by the cafeteria in time to purchase a snack. Only bananas, fruit cocktail, chocolate pudding, cheese and rye wafers, and brownies are left. Which do you choose?

6. You are finally home. You need a snack to tide you over. A raid of the refrigerator reveals a piece of chocolate pie, a cold drink, a container of yogurt, fresh broccoli, carrots, cauliflower, cottage cheese dip, and a hard-cooked egg. Which do you choose?

7. You need munchies while watching the Friday night movie. There is a bowl of fresh apples, ice cream, pretzels, and corn chips in the kitchen. Which do you choose?

8. You are craving a snack before bedtime. The refrigerator reveals leftover chicken, cheesecake, bread, apple juice, and lemonade. What do you choose?

LESSON OBJECTIVE

Describe nutritional needs throughout the life cycle.

ASSESSMENT CRITERIA

Demonstrate meal planning to meet nutritional needs throughout the life cycle.

ACTIVITIES & STRATEGIES

We all need the same nutrients to stay healthy. However, there are many factors which determine the quantity of each nutrient needed. These factors include:

- age
- degree of activity
- sex
- size
- pregnancy
- hypertension
- diabetes
- heart disease
- other medical conditions

Assign the students to do a research report on the different stages throughout the life cycle. The students could work individually or in groups. If the students work in groups, let them decide how they will present their information to the class. If time permits, a laboratory experience could be planned; groups could prepare a meal for the age group they researched. Depending on the size of the class and the money available, some groups could be combined for the meal preparation.

The life cycles should include these stages:

- infants
- preschool children
- children from 6 to 9 years
- children from 9 to 12 years
- teenagers
- adults
- elderly
- pregnant women
- nursing mothers

RESOURCES & MATERIALS

"Appendix C: A Pattern for Daily Food Choices"

"Appendix D: Recommended Dietary Allowances"

Library references
Nutrition reference books and/or textbooks
Food, if time and money permit, for the laboratory experience

TEACHER TIPS

- **Students could go to the library or work on research in the classroom depending on time and materials.**
- **This lesson could cover a four or five day period; one day for research, a day for oral reports, a day for planning lab, a day for preparing the lab, and a day for evaluation and testing.**

ESSENTIAL ELEMENT

Vocational and applied technology education. Food science and nutrition. Concepts and skills related to nutrition. The student shall be provided opportunities to determine nutritional needs throughout the life cycle.

Vocational Education

High School

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Describe nutritional needs throughout the life cycle.

ASSESSMENT CRITERIA

Evaluate various methods of nourishing the infant.

ACTIVITIES & STRATEGIES

Define ***lactation:*** the secretion or formation of milk; the period of milk production.

Define ***colostrum:*** a thick alkaline fluid with a deep lemon yellow color, suited to the immature digestive enzyme system of the newborn; also contains antibodies.

Define ***formula***: cow's milk which is diluted and then has carbohydrates and nutrients added to make it nutritionally comparable to human milk.

Ask students to list the advantages and disadvantages of breast feeding and bottle feeding.

Lead a discussion on bonding as it relates to feeding the infant. ***Bonding*** is defined as a closeness developed between mother and child that gives the baby a feeling of love and security.

Using the teacher resource, "Milk Source Facts," explain the scientific reasons that human milk is a more nutritious food for newborns than formula milk.

Instruct each student to choose a method of infant feeding, and write a paragraph that supports that method.

RESOURCES & MATERIALS

Teacher Resource: "Milk Source Facts"

Nutrition in the Life Span by Virginia A. Beal. New York: John Wiley and Sons, Inc., 1980

TEACHER TIPS

- **Expand the activity by bringing samples of baby formula. Ask students to analyze the nutrient content from the labels and calculate the cost per serving. Extend the cost to one week and one month.**
- **A guest speaker from La Leche League would reinforce the benefits of human milk.**

ESSENTIAL ELEMENT

Vocational and applied technology education. Parenting and child development. Concepts and skills related to child development. The student shall be provided opportunities to describe the emotional and social development of children and techniques for fostering such development.

MILK SOURCE FACTS

- The nutritional needs of the infant are better met by human milk than by any substitute.
- Breast milk has not been improved on as a reference standard. It is sterile, ready-mixed, and the correct temperature.
- When cow's milk is fed to the human infant, it must be adapted to the physiological capabilities and requirements of the infant.
- Changes in lifestyles and women's views of their own roles accentuated the trend toward bottle feeding.
- Commercial formulas are continually changing with the expansion of science and knowledge.
- Cow's milk is higher in saturated acids and human milk is higher in unsaturated fatty acids.

NUTRITIVE VALUES OF COW'S MILK AND HUMAN MILK

Nutritive Values Per Liter	*Cow's Milk*	*Human Milk*
Energy (kcal)	660	690
Protein (g)	35	9
Fat (g)	38	40
Lactose (g)	49	68
Vitamins		
Vitamin A (IU)	1025	1898
Vitamin D (activity)	14	40
Vitamin E (IU)	0.4	3.2
Vitamin K (µg)	170	34
Thiamin (mg)	370	150
Riboflavin (mg)	1700	380
Niacin	0.9	1.7
Ascorbic Acid (mg)	17	44
Minerals		
Calcium (mg)	1200	241-340
Phosphorus (mg)	920	150
Iron (mg)	0.5	0.56-0.3

Adapted from *Nutrition in Pregnancy and Lactation* by Worthington-Roberts, Vermeersch, and Williams. Third Edition. St. Louis, Missouri: Times Mirror/Mosby College Publishing, 1985.

LESSON OBJECTIVE

Discuss ways to achieve a low-fat diet.

ASSESSMENT CRITERIA

- Identify sources of fat in the diet.
- List methods for reducing dietary fat.

ACTIVITIES & STRATEGIES

Discuss the following information about fats:

- Functions of fat in the body:
  - provides energy
  - transports and absorbs fat-soluble vitamins
  - cushions vital organs in the body
  - comprises part of the structure of body cells
  - supplies essential fatty acids
  - satisfies appetites by delaying hunger
  - insulates the body
  - serves as protection for nerves and blood vessels
- Functions of fat in food preparation:
  - tenderizes food products
  - aerates batters and doughs
  - acts as an emulsifying agent (An emulsifying agent is an ingredient added to an oil and liquid mixture that keeps oil and liquid from separating.)
  - adds flavor and moisture to foods
  - acts as a heating medium for sautéing and frying
- Why do we need fat in the diet?

Provide students with a display of labels from foods containing fat. Evaluate the fat content of the food examples.

Identify common fats used in food preparation (butter, margarine, lard, vegetable oils, and vegetable shortenings).

Ask the students to research cookbooks and magazines to locate recipes containing large amounts of fat, especially animal fats. Instruct students to modify the recipes to lower the fat content or substitute vegetable fat.

Discuss and select recipes to be prepared and tasted in class.

RESOURCES & MATERIALS

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Selected foods for display

Cookbooks
Magazines

TEACHER TIPS

- **Explain to the students the meanings and uses of these terms in food advertising: "Lite," "Low-fat," and "Cholesterol-free."**
- **Three-fourths cup of vegetable oil equals one cup of solid shortening.**
- **Additional helpful information on fat is found in the "Instructor's Resource Guide for Teaching Nutrition Education."**

ESSENTIAL ELEMENT

Vocational and applied technology education. Food science and nutrition. Concepts and skills related to nutrition. The student shall be provided opportunities to assess long term effects of food choices on health.

LESSON OBJECTIVE

Examine ways to reduce intake of cholesterol.

ASSESSMENT CRITERIA

- Determine the role of cholesterol in causing heart attack and stroke.
- Discuss the risk factors for developing atherosclerosis.
- Suggest a diet that will reduce the risk of cardiovascular disease.

ACTIVITIES & STRATEGIES

Distribute the handout, "Mr. American Diet on Trial," to the students.

Instruct the students to arrange the seating of the class in a way that would represent a courtroom.

Assign or ask for volunteers to play the characters, giving the jury foreman's role to yourself. Instruct each character to make a placard stating the name of the character that he or she will be enacting. Tell the students to hang the signs from strings around their necks.

Assign the remaining students the role of jury. They are to take notes and read along with the script to help determine the guilt or innocence of Mr. American Diet. The information in the script will also help them make suggestions for reform options in the event that Mr. American Diet is found guilty.

Tell the characters to take their places to begin the play.

After the play, discuss ways that Mr. American Diet can improve his blood cholesterol level.

Vocational Education **High School**

TEXAS EDUCATION AGENCY

RESOURCES & MATERIALS

Handout: "Mr. American Diet on Trial"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

"Heart Challenges," American Heart Association Schoolsite Program, High School

5x7 cards
Felt tip markers
Hole punch
String
Scissors

TEACHER TIP

This could be an integrated social studies activity with a civics or government class.

In advance, assign the student who is the prosecuting attorney to ask the cafeteria manager to provide a tray of high-cholesterol foods to be used as evidence.

ESSENTIAL ELEMENTS

Vocational and applied technology education. Comprehensive home economics. Concepts and skills for managing food and nutrition for families and individuals. The student shall be provided opportunities to analyze basic nutrition need as results of dietary practices. Vocational and applied technology education. Food science and nutrition. Concepts and skill related to nutrition. The students shall be provided opportunities to assess long term effects of food choices on health; compare various guidelines for dietary planning; and relate food intake to individual and family health.

Mr. American Diet on Trial

Characters:
Narrator
Mr. American Diet (Mr. A.D.)
Bailiff
Prosecuting Attorney (P.A.)
Defense Attorney (D.A.)
Judge
Jury Foreman
Jury

Setting: *(Courtroom in Anytown, U.S.A.)* Mr. American Diet is on the witness stand, about to be sworn in by the bailiff. The judge is seated next to Mr. American Diet, and the Defense Attorney and the Prosecuting Attorney are each seated at tables, facing the Judge.

Narrator: As we begin our play, Mr. American diet seems a bit uncomfortable at the prospect of being held responsible for the death of thousands of heart attack and stroke victims each year. These strokes and heart attacks have been brought on by an excess of cholesterol in the diet. He is very defensive and angry. The prosecuting attorney is equally angered by the death and illnesses which he believes have resulted from the ingestion of too much cholesterol in the diet of the American people. The defense attorney seems smug and a bit unconcerned. The jury is busily taking notes, in hopes of rendering a fair verdict at the end of the trial. Let's listen in as the bailiff begins to swear in Mr. American Diet.

Bailiff: *(standing in front of Mr. American Diet, whose right hand is held up)*
Do you swear to tell the truth, the whole truth, and nothing but the truth, so help you God?

Mr. A.D.: I do.

P.A.: State your name in full for the record.

Mr. A.D.: My name is Mr. American Diet.

P.A.: You are being accused of contributing to the deaths of thousands of Americans each year. Coroner's reports indicate that thousands die of cardiovascular disease, brought on by atherosclerosis.

Mr. A.D.: *(exasperated)*
Hold on! Hold on! Stop all this medical mumbo-jumbo. Athero–what? Cardio–what disease?

P.A.: ***Cardiovascular disease*** is a term that covers all the diseases of the heart and blood vessels. ***Atherosclerosis*** is hardening of the arteries, characterized by a thickening of the artery walls with plaques. Please allow me to define the word *plaques* before you ask what it is. ***Plaques*** are mounds of lipid matter that accumulate on the inner walls of the arteries.

Mr. A.D.: So what! I don't know what all this has to do with me!

P.A.: I'll tell you what it has to do with you. Are you familiar with something called cholesterol?

Mr. A.D.: Yes, I am.

P.A.: Please describe, in your own words, what this is, and what the body does with it.

D.A.: Objection! I see no relevance to this line of questioning.

P.A.: *(to Judge)* If it pleases the court, Your Honor, I intend to prove that Mr. American Diet intentionally subjects his victims to a form of cholesterol that leads to heart attack and stroke.

Judge: You may continue. Mr. American Diet, please answer the question.

Mr. A.D: *(agitated)*
Alright! There is something called *cholesterol* found among the fats in the bloodstream. ***Cholesterol*** is an odorless, soft, fat-like substance found in every cell in the body. It is used to form cell membranes and certain types of hormones. It assists the body in manufacturing vitamin D. It also plays a role in digestion. People obtain cholesterol in two ways. It is found in foods that come from animals, and also the body manufactures it, primarily in the liver.

231

P.A.: Well, well, well, Mr. Diet, you sound fairly informed for someone who protests about medical mumbo-jumbo.

Mr. A.D.: Let's just say that I have been accused of causing cardiovascular disease before.

P.A.: *(smugly)* Yes, I see, yet you still insist that you are innocent of any wrong doing concerning the deaths of these people. Let's back up a minute. Cholesterol and other fats can't dissolve in the blood. Lipoproteins then transport this cholesterol. There are several types of lipoproteins. Two types of lipoproteins are LDL and HDL.

Mr. A.D.: Yes, low density lipoproteins and high density lipoproteins.

P.A.: Yes, I see, yet you still insist that you are innocent of any wrongdoing concerning the deaths of these people. Let's back up a minute. Cholesterol and other fats can't dissolve in the blood, but lipoproteins are the special molecules that carry the cholesterol throughout the body. Right? And then there are the two main kinds of lipoproteins, LDL and HDL. Is this correct?

Mr. A.D.: Yes, low density and high density lipoproteins.

P.A.: Please describe to the jury everything you know about these lipoproteins.

Mr. A.D.: If you insist! Some say the HDL is the "good guy" because it carries cholesterol to the liver where it is processed into harmless substances. However, the LDL keeps the cholesterol in the bloodstream where it is deposited.

P.A.: Deposited where, Mr. American Diet?

Mr. A.D.: *(whispering)* On the artery walls.

P.A.: Louder, Mr. American Diet.

D.A.: Objection! Council is badgering the witness.

Judge: Overruled. Please answer the question Mr. American Diet.

Mr. A.D.: *(annoyed, but louder)* I said, on the artery walls.

P.A.: Please state what this leads to.

Mr. A.D.: *(aggravated)* This leads to the development of atherosclerosis, which is a type of hardening of the arteries.

P.A.: And what does atherosclerosis lead to?

Mr. A.D.: *(highly provoked)* Atherosclerosis leads to the closing or blocking of the arteries that supply blood to the heart and brain. Obstruction or blockage in the arteries can cause heart attacks and strokes.

P.A.: Are you aware of the risk factors that relate to atherosclerosis?

Mr. A.D.: I am, and that's why I don't think you can blame these deaths on me.

P.A.: I see. Please tell the jury what the risk factors for developing atherosclerosis are.

Mr. A.D.: Smoking, gender—males are more prone to heart disease, heredity—persons with family history of heart disease, high blood pressure, lack of exercise, stress, and personality characteristics—persons who are competitive, tense, and resist fatigue.

P.A.: Please don't leave out the other two risk factors, Mr. American Diet. What are they?

D.A.: *(loudly)* Objection!

Judge: Overruled! The witness will please answer the question.

Mr. A.D.: The other two factors are obesity and high blood cholesterol levels. Levels that are over 200 milligrams per 100 milliliters of blood are considered high.

P.A.: Please state for the court the dietary goals that can lower blood cholesterol levels.

Mr. A.D.: *(sarcastically)* Do you have a pen and pad? There are seven of them.

Judge: Just answer the question.

Mr. A.D.: Yes, Your Honor.

1. Reduce total fat intake to 30 percent of total calories.
2. Include more whole grains in the daily diet.
3. Eat fish more often.
4. Increase consumption of fiber-rich fruits and vegetables.
5. Add the many varieties of legumes to the daily diet more often, such as dried beans and peas and soybeans.
6. Include nonfat or low-fat milk and milk products every day.
7. Reduce the cholesterol-rich foods in the diet, especially organ meats, egg yolks, shellfish, and fatty red meats.

P.A.: Very good, Mr. American Diet! Please tell the jury why you have not tried to meet these goals.

D.A.: Objection! Your Honor! Again, I question the relevance of this line of questioning!

P.A.: *(haughtily)* Your Honor, I am trying to establish that Mr. American Diet is well aware of the risks involved in eating foods laden with cholesterol, and that for some unknown reason he chooses to continue to promote these potentially lethal foods that cause the death of thousands of people each and every year from heart attack and stroke.

Judge: The witness will please answer the question.

Mr. A.D.: The reason I don't try to meet these goals is that ...., I don't follow them because.....I mean to say that I don't.......... well Your Honor, I am not exactly sure why I don't.

P.A.: *(to the Judge)* I have no further questions, Your Honor. He is your witness, defense attorney.

D.A.: I have no questions for this witness.

Judge: Are there any more witnesses?

P.A.: No, Your Honor.

D.A.: I have none, Your Honor.

Judge: *(to jury)* It is your job, members of the jury, to determine whether the witness, Mr. American Diet is indeed guilty of causing the deaths of thousands of Americans each year by heart attack and stroke. Please render the verdict on the basis of the information given in the trial. If you find Mr. American Diet to be guilty of these deaths, please be prepared to offer to me suggestions for how Mr. American Diet can help reduce the risk of others who may fall victim to cardiovascular disease. Please feel free to look at the court record of the trial, and at your notes.

Jury Foreman: *(to jury)* We need to come up with a verdict. Please discuss the following questions:

1. **What role does cholesterol, specifically LDL, play in causing the deaths of thousands each year by heart attack and stroke?**
2. **What are the risk factors for developing atherosclerosis?**
3. **Is Mr. American Diet guilty or innocent in the deaths of thousands by cardiovascular disease?**
4. **In what ways can Mr. American Diet reform in order to reduce the risk of cardiovascular disease to the American people?**

Thank you members of the jury. We will inform the court of our decision.

LESSON OBJECTIVE

List strategies for reducing the amount of sugar in the diet.

ASSESSMENT CRITERIA

- Analyze labels for different types of sugar.
- List methods of reducing sugar in the diet.

ACTIVITIES & STRATEGIES

Part 1 of a two-part lesson (sugar)

Introduce these facts to the students:

- The average American consumes about sixty to eighty pounds of sugar a year. That is approximately one-fourth pound of sugar per day.
- Food labels often list other terms for sugar, such as:
  - brown sugar
  - confectioners' sugar
  - corn sweeteners
  - dextrose
  - granulated sugar
  - high-fructose corn sweeteners
  - honey
  - invert sugars (glucose and fructose)
  - maple sugar
  - molasses
  - natural sweetener
  - raw sugar
  - syrup

It is recommended that people reduce their sugar intake to only 10 percent of total calories and increase their complex carbohydrate intake to 50 percent of total calories.

Divide the class into small groups. Provide a label for each group.

Assign the students to analyze and list the different kinds of sugar included in the label, the order in which it is listed on the label, and the number of calories per serving, if available. Tell each group to select a spokesperson to report the label information to the class.

Display and discuss the transparency, "You Won't Miss the Sugar," with the class. Include a discussion on the health problems related to consuming too much sugar in the diet, and list some ways to reduce sugar in the diet.

RESOURCES & MATERIALS

Transparency: "You Won't Miss the Sugar"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Labels from canned foods, cereal boxes, cake mixes, and any other food containing sugar

Overhead projector

ESSENTIAL ELEMENT

Vocational and applied technology education. Food science and nutrition. Concepts and skills related to nutrition. The student shall be provided opportunities to relate food intake to individual and family health.

YOU WON'T MISS THE SUGAR

Suggestions for Reducing Sugar In The Diet:

- Select pure fruit juices rather than soft drinks or imitation fruit drinks.
- Select fresh fruits or fruits packed in water, juice, or light syrup rather than ones in heavy syrup.
- Select fresh fruits for snacks. The sugar content of dried fruits is much higher than that of fresh fruits.
- Read ingredient labels to identify the types of sugars in the product.
- Select sugar-free cereals.
- Try using sweet spices such as allspice, cardamom, cinnamon, cloves, coriander, ginger, and nutmeg to replace some of the sugar.
- Reduce the sugar in foods prepared at home. Start by reducing the sugar gradually until you have decreased it by one-third or more.
- Use home-prepared items instead of commercially prepared ones.
- Learn to use less sugar on cereals.
- Use less sugar in coffee and tea or learn to drink them without sugar.

Nutty Apple Bread

1 cup whole wheat flour
1 cup white flour
1 tsp. cinnamon
2 tsp. baking powder
1/4 tsp. salt
6 tbsp. margarine
1/2 cup sugar
2 eggs, beaten
1 cup, large tart
  apple, coarsely shredded
1/2 cup chopped nuts
1/4 cup skim milk
1/2 cup raisins

- **Preheat the oven to 375° F.**
- **Combine the flours, baking powder, and salt in a small bowl.**
- **Set aside.**
- **In a large bowl, cream the margarine and the sugar.**
- **Add the beaten eggs and continue to beat until fluffy.**
- **Stir in the apple and 1/4 cup of the nuts**
- **Add half the flour mixture, stirring well.**
- **Stir in the milk and the remaining flour mixture.**
- **Add the raisins.**
- **Pour into a greased, 9"X 5"X 3" loaf pan or two 7"X 3"X 2" pans.**
- **Sprinkle remaining nuts on the top.**
- **Bake 35 to 40 minutes or until a toothpick inserted in the center comes out clean.**
- **Cool on a rack and remove from the pan(s).**

NOTE: Chopped dates, prunes, or other dried fruit may be substituted for the raisins.

Nutritional analysis of one slice= 30 g carbohydrates; 6 g fat; 3 g protein; 163 calories

LESSON OBJECTIVE

List strategies for reducing the amount of sugar in the diet.

ASSESSMENT CRITERIA

Demonstrate ways to reduce sugar intake in the diet.

Vocational Education

High School

HS

TEXAS EDUCATION AGENCY

ACTIVITIES & STRATEGIES

Part 2 of a two-part lesson (sugar)

Conduct an experimental foods laboratory. Two to three days may be needed for this lesson depending on the length of the class periods.

The lesson could be divided as follows:
First day: Review the transparency and plan the lab.
Second day: Prepare the food, and bake. (Sample and evaluate, if time permits.)
Third day: Sample and evaluate, if time does not permit on the second day.

Review the transparency, "You Won't Miss the Sugar."

Prepare:
- Nutty Apple Bread (See transparency for recipe.)
- carrot cake
- zucchini bread
- cookies or cake (Experiment with reducing sugar by one-third.)

Sample and evaluate:
- Did you like the food with less sugar?
- Could you train yourself to enjoy food with less sugar?
- What could be the long-term effect of eating too many foods high in sugar content? (obesity, possibly diabetes, heart disease, and cancer)
- What is the main nutrient which we receive from desserts? (carbohydrates)
- What is the function of this nutrient? (provides energy)

RESOURCES & MATERIALS

Transparency: "You Won't Miss the Sugar"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Recipes

Food supplies for selected recipes

TEACHER TIP

The transparency master: "You Won't Miss the Sugar," could also be used as a handout.

ESSENTIAL ELEMENT

Vocational and applied technology education. Food science and nutrition. Concepts and skills related to nutrition. The student shall be provided opportunities to assess long term effects of food choices on health.

Vocational Education

High School

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Evaluate dietary needs of women during pregnancy and lactation.

ASSESSMENT CRITERIA

Identify daily food needs for expectant mothers.

ACTIVITIES & STRATEGIES

Discuss the following information with the students:

- The growth and development of the fetus increases the daily nutrient needs of the expectant mother. An increased need for protein, folate, vitamin B_{12}, calcium, phosphorus, magnesium, and iron is necessary to supply enough nutrients for fetal growth and development as well as for the mother's nutritional health.
- Stress that the fetus is nourished before the mother's body. This may result in the mother's body being depleted.
- Even though the nutrient needs are much greater, the pregnant woman's energy needs increase only about 15 percent. This means the expectant mother should choose foods of high-nutrient density rather than just empty calories.
- ***Nutrient density*** describes the amount of nutrients a food contains compared to its calories.
- The practice of good nutrition during pregnancy is critical. During the first trimester, or approximately thirteen weeks, inadequate nutrition or drug use can result in birth defects.
- By the end of the first trimester, the heart is completely formed and beating, and most of the other organs are formed.
- During the second trimester, the fetus continues to grow and develop, and the bones become noticeably visible throughout the fetus' body.
- The third trimester is also a very critical time for development. Deficiencies in certain nutrients can cause damage to the eyes, brain, and genitals as development is completed.

Distribute the handout, "Two Guests for Lunch." Choose three students to enact the play. Then, discuss the daily food requirements for the expectant mother.

RESOURCES & MATERIALS

Handout: "Two Guests for Lunch"

DAILY FOOD REQUIREMENTS OF AN EXPECTANT MOTHER

Milk & milk products -	**4**
Meats & Protein-rich foods	
Animal protein -	**2 (2oz.)**
Vegetable proteins -	**2**
Fruits & Vegetables	
Vitamin C-rich -	**1**
Dark green -	**1 or 2**
Others -	**2**
Breads & Cereals	
Whole-grain, enriched -	**4**

ESSENTIAL ELEMENT

Vocational and applied technology education. Comprehensive home economics. Concepts and skills for managing food and nutrition for families and individuals. The student shall be provided opportunities to analyze basic nutrition needs and results of dietary practices.

NAME ______________________________ **DATE** ____________________

Two Guests for Lunch

Setting: Mother's Womb. She is carrying twins; one boy and one girl.
Characters: Narrator, Baby Boy, Baby Girl. **Time:** 11:30 A.M.

Narrator: Pregnancy is a very important stage in the life cycle. Many young women do not realize that their nutritional health during the years before they become pregnant has an effect on their future pregnancy and the development of the fetus. It is also important to realize that decisions the expectant mother makes about nutrition affect her baby's health and its future. As we begin our story, Baby Girl and Baby Boy are discussing the fact that they think it is time for lunch.

Baby Girl: (loudly, complaining) Mom!! He's touching me!!

Baby Boy: (frustrated) Excuse me Baby Girl, but you are on my side of the womb!

Baby Girl: (angry) Your side!

Baby Boy: (apologetically) I'm sorry, I think that we're both a little grouchy because mom hasn't eaten anything since breakfast. I think I'll sooth my hunger by sucking on my thumb.

Baby Girl: I'm sorry too. I know I'm hungry! By the way, that isn't your thumb, that's my big toe!

Baby Boy: (shocked) YUCK!!

Baby Girl: Well anyway..... What do you hope mom has for lunch?

Baby Boy: We know she needs four servings of milk every day, so I hope she eats some yogurt or drinks a big, tall glass of milk.

Baby Girl: I hope she goes for the chicken sandwich on the whole wheat bun, with orange juice, spinach salad, a banana, an apple, some peanuts, and....

Baby Boy: (excited) Wait a minute! If she eats all that she won't have any room for us!

Baby Girl: Well, then let's think this through. Mom needs four servings of breads and cereals in a day...

Baby Boy: I love breads and cereals!

Baby Girl: She needs two servings of meat.

Baby Boy: I love meat!

Baby Girl: She needs two ounces of vegetable protein, like dried beans and peas...

Baby Boy: I love dried beans and peas!

Baby Girl: .....one serving of a vitamin C-rich fruit or vegetable, one or two servings of dark green vegetables, and two servings of other fruits and vegetables.

Baby Boy: I love fruits and vegetables!

Baby Girl: (exasperated) Well, Baby Boy, what is it that you don't love?!

Baby Boy: Uh, well....(loudly, with hand to mouth, shouting at Mom) I don't like waiting for lunch!

Baby Girl: (quietly) shhh!..listen! Do you hear what I hear?

Baby Boy: I think so. Is that crunching?

Baby Girl: That is crunching!!

Baby Boy: (excitedly) OH BOY !....LUNCH !!!

LESSON OBJECTIVE

Evaluate dietary needs of women during pregnancy and lactation.

ASSESSMENT CRITERIA

- Recognize the risk factors that contribute to malnutrition during pregnancy.
- Plan a diet to meet the special needs of women during pregnancy.

ACTIVITIES & STRATEGIES

Discuss the following nutritional considerations during pregnancy.

- Nutrients reach the developing fetus through the mother's bloodstream.
- The placenta, a sort of cushion in which the mother's and the fetus' blood vessels intertwine, provides for the exchange of nutrients and oxygen into the baby's system.
- If the mother's nutrient stores are not adequate early in pregnancy when the placenta is developing, the early development of the fetus will be affected.

Distribute the worksheet, "Nutrition During Pregnancy." The 1500 calorie menu is for a woman who is not pregnant. Instruct the students to revise the menus to make them adequate to meet the RDA for a pregnant adult.

Discuss the calories and the recommended dietary needs of the pregnant adult by referring to "Appendix D: Recommended Dietary Allowances."

Compare and evaluate the two different menus using "Appendix D: Recommended Dietary Allowances," and "Appendix E: Food Composition Table."

Discuss effects of malnutrition on the fetus:

- low birth weight
- birth defects
- mother's body is malnourished

Summarize risk factors that contribute to malnutrition during pregnancy.

- age (15 years or younger)
- drug addiction
- alcohol abuse
- tobacco use
- 15 % over or under normal weight
- unwanted pregnancy
- many pregnancies close together
- poverty

RESOURCES & MATERIALS

Worksheet: "Nutrition During Pregnancy"

"Instructor's Resource Guide" found in the introductory section of *ESR IV*

"Appendix D: Recommended Dietary Allowances"

"Appendix E: Food Composition Table"

TEACHER TIP

The chart, "Special Nutrition Requirements During the Stages of the Life Cycle" found in the "Instructor's Resource Guide for Teaching Nutrition Education" provides additional information on nutrition during pregnancy.

ESSENTIAL ELEMENT

Vocational and applied technology education. Food science and nutrition. Concepts and skills related to nutrition. The student shall be provided opportunities to determine nutritional needs throughout the life cycle.

NAME ______________________ DATE ______________

Nutrition During Pregnancy

Directions: The meals on the left reflect a basic 1500 calories menu. Revise the meal plans to show serving size adjustments or menu substitutions for a day's meals that would meet the nutritional needs of a pregnant woman.

Morning Meal	**Revised Morning Meal**
1 scrambled egg 1 slice buttered wheat toast 1 cup coffee	
Noon Meal	**Revised Noon Meal**
1 ounce boneless baked fish 1/2 cup macaroni 1/2 cup broccoli 1 cup milk 1 cup green beans	
Evening Meal	**Revised Evening Meal**
2 ounces lean broiled sirloin steak 1 cup black-eyed peas 1/2 cup carrots 1 slice white bread 1 cup unsweetened tea 1 medium orange	
Snacks During the Day	**Revised Snacks**
1 ounce cheddar cheese 4 saltine crackers 1 cup vanilla ice cream	

LESSON OBJECTIVE

Describe the relationship between nutrition and the prevention and treatment of health problems (cancer, common cold, diabetes, heart disease, PKU).

ASSESSMENT CRITERIA

Identify the foods that can protect us against cancer.

ACTIVITIES & STRATEGIES

Part 1 of a two-part lesson (cancer)

Tell students that cancer is the second leading cause of death in the United States. Cancer develops through multiple steps, but the two main steps are initiation and promotion. Most people are exposed to the initiation process because cancer-causing agents are present in our environment. However, initiation does not inevitably lead to cancer.

Define the term ***cruciferous:*** vegetables in the cabbage family with leaves that form a cross. Cabbage-family vegetables contain compounds which may work as cancer inhibitors.

Display samples of cruciferous vegetables. Allow students to examine the shape, texture, and odor of all the food samples.

Distribute the worksheet, "Cancer Protectors." Discuss the protectors and how they work to protect us from cancer.

Instruct students to complete their worksheet. Ask students to share their answers with the class. Allow for discussion.

Distribute school lunch menus. Ask students to identify foods that are cancer protectors.

Adapted from "Changing the Course: Secondary Curriculum," American Cancer Society, pp. 31-34.

RESOURCES & MATERIALS

Worksheet: "Cancer Protectors"

"Instructor's Resource Guide for Teaching Nutrition Education" found in the introductory section of *ESR IV*

Advanced Food Science and Nutrition. Home Economics Curriculum Center, Texas Tech University, P.O. Box 41161, Lubbock, Texas 79409-1161, (806) 742-3029

"Cancer/Reduce Your Risk," a poster from the American Cancer Society

Samples of cruciferous vegetables
School lunch menus

TEACHER TIP

Additional examples of cruciferous vegetables:

bok choy
Brussels sprouts
cabbage
cauliflower
Chinese cabbage
kale
kohlrabi
mustard greens
radish
rutabaga
turnip
watercress

In advance, ask the cafeteria manager for a copy of one month's menus.

ESSENTIAL ELEMENT

Vocational and applied technology education. Food science and nutrition. Concepts and skills related to nutrition. The student shall be provided opportunities to assess long term effects of food choices on health.

NAME ______________________________ DATE ______________

CANCER PROTECTORS

Protectors	*Protective Factors*	*How Protective Factors Work*
Whole grains	Fiber	• Dilutes cancer-promoting agents in the intestines • Promotes healthy intestinal environment • Binds with cancer-promoting agents, helping the body to excrete them • Increases the rate at which food moves through the digestive tract, limiting the contact time of cancer-promoting agents with intestinal cells
Dried beans and peas	Fiber	
Vegetables	Fiber Vitamin C Vitamin A-(beta carotene)	• Inhibits tumor growth • Neutralizes and helps excrete cancer-promoting agents • Produces antioxidants that interfere with the formation of damaging compounds in the cells of the body.
Fruits	Fiber Vitamin C Vitamin A-(beta carotene and carotenoids)	• Produces antioxidants that interfere with the formation of damaging compounds in the cells of the body • Protects cell membranes

1. Define cruciferous vegetables.

2. An example of a cruciferous vegetable is broccoli. List additional examples of cruciferous vegetables.

3. Analyze your daily diet and list the foods which you eat two or more times a week. Place a star by those foods which are considered protectors.

Adapted from the "Changing the Course: Secondary Curriculum," American Cancer Society.

LESSON OBJECTIVE

Describe the relationship between nutrition and the prevention and treatment of health problems (cancer, common cold, diabetes, heart disease, PKU).

ASSESSMENT CRITERIA

Analyze foods which could promote or contribute to the development of cancer.

ACTIVITIES & STRATEGIES

Part 2 of a two-part lesson (cancer)

Tell students that excessive consumption of certain foods and/or certain additives found in foods can contribute to the development of cancer.

Foods which are considered to be promoters of cancer are:

- **Fat and fatty foods.** The average American eats the equivalent of about 24 teaspoons of fat a day which is the amount of fat contained in a stick of butter or margarine. Eating too much fat may increase the chances of developing cancer of the breasts, colon, and prostate. Ideally, no more than 30 percent of total calories should come from fat. The average American gets about 40 percent of his or her calories from fat and fatty foods.
- **Salt-cured and smoked foods**. Many cured, smoked, and oriental pickled foods contain ***nitrites***. Nitrite is a chemical added during the processing of these foods that adds color and acts as a preservative. In the intestine, nitrites combine with proteins to form nitrosamines which are compounds that can increase the risk of cancer of the stomach and esophagus. Many food companies are adding less nitrites during processing, but the foods listed in the next column may contain nitrites and should be eaten in moderation.
- **Charred foods**. Eating the burnt and blackened portion of barbecued and blackened foods may also increase the risk of cancer.

Instruct students to refer to their list of foods from #3 in the worksheet, "Cancer Protectors," in the previous lesson. Place a mark by the foods which would be considered cancer promoter foods. Discuss some of the foods marked by students and ways that they could improve their diets.

Assign the students to plan a buffet luncheon which contains only cancer protector foods. Prepare the buffet luncheon in lab on the following day. Evaluate the food's appearance, flavor, and texture. Enjoy a healthy lunch!

RESOURCES & MATERIALS

Worksheet: "Cancer Protectors"

Laboratory plans of the local teacher

Foods which may contain nitrites:
Ham
Smoked fish
Smoked turkey
Smoked duck
Bacon
Sausage
Bologna
Pastrami
Corned beef
Liverwurst
Salami
Pepperoni

This lesson has been adapted from "Changing the Course: Secondary Curriculum," American Cancer Society, pp. 31-34.

In advance, invite the cafeteria manager to discuss what is being done to reduce fat and foods that contain nitrites in the school menus.

ESSENTIAL ELEMENT

Vocational and applied technology education. Food science and nutrition. Concepts and skills related to nutrition. The student shall be provided opportunities to assess long term effects of food choices on health.

LESSON OBJECTIVE

Describe the relationship between nutrition and the prevention and treatment of health problems (cancer, common cold, diabetes, heart disease, PKU).

ASSESSMENT CRITERIA

Identify factors which influence modifications in the diabetic diet.

ACTIVITIES & STRATEGIES

Define ***diabetes:*** diabetes melliltus is a disease in which the body is unable to metabolize (produce) or use insulin (glucose) properly.

List symptoms of untreated diabetes:
- increase in output of urine
- itching skin
- weakness
- weight loss
- increased thirst
- increased appetite

List the clinical tests for diabetes:
- sugar in the blood
- sugar in the urine

Divide class into groups and tell them to analyze food labels on prepared foods for hidden sources of sugars.

Discuss the information in the transparency, "Diabetic Diet Guidelines." Instruct the students to use this information to help them in planning a day's menu for a person with diabetes.

Summarize contributing factors for controlling diabetes:
- changes in eating habits
- weight control
- exercise program
- medication, if necessary

Option:
Do an actual blood test using a blood sugar monitor on a volunteer who has diabetes.

RESOURCES & MATERIALS

Transparency: "Diabetic Diet Guidelines"

American Diabetes Association (local chapter)

The Diabetic Diet, (16 mm film from the Nutrition Education and Training Library) see Appendix A

The Tufts University Guide to Total Nutrition by Stanley Gershoff, Ph. D. with Cathrine Whitney

TEACHER TIP

Ask the school nurse or registered dietitian to explain the food exchange list and give examples of diet modification for diabetics.

ESSENTIAL ELEMENT

Vocational and applied technology education. Advanced food science and nutrition. Concepts and skills related to the significance of nutrition. The student shall be provided opportunities to plan diets to meet special dietary needs.

DIABETIC DIET GUIDELINES

- **There is no one proper *diabetic diet*.**
  Dietary requirements are based on:
  - the individual
  - the severity of the disease
  - the type and dosage of insulin prescribed
  - the amount of exercise
  - the person's weight

- **Advisable:**
  - Establish a feeding schedule to maintain correct blood sugar levels.
  - Eat all foods prescribed.
  - Eat a diet high in complex carbohydrates such as vegetables, fruits, and whole grains.
  - Increase your intake of water-soluble fibers such as oats, barley, bran, lentils, and beans.
  - Increase your intake of foods that are high in fiber such as dried fruits, nuts, and seeds. Studies indicate that high-fiber diets tend to lower levels of blood sugar, thus lowering the need for insulin.

- ***Remember that diabetics run a high risk of developing heart disease. Recommendations for a healthy heart include:***

  - Reducing your daily fat intake to no more than 30 per cent of your total intake.
  - Selecting leaner cuts of meats.
  - Trimming fat before cooking.
  - Eating chicken and fish several times a week.
  - Limiting daily cholesterol intake to 300 mg per day.
  - Decreasing your intake of foods that are high in sodium.
  - Lowering your consumption of candies and foods that are made with processed sugars.
  - Incorporating a regular program of exercise which lowers blood sugar levels and helps control weight gain.

LESSON OBJECTIVE

Analyze nutrition information on food labels.

ASSESSMENT CRITERIA

Identify the required and voluntary information on food labels.

ACTIVITIES & STRATEGIES

Assign each student to bring one or more food labels from home.

The Food and Drug Administration (FDA) is an agency of the U.S. Department of Health and Human Services and its main function is to ensure that the United States food supply is safe.

Specific guidelines for information required on labels include:
- Labels must be in English.
- Labels must list the name and address of distributor, manufacturer, or packer.
- Net content must be listed. (weight, measure, or count)
- Label must show the common names of the food and each ingredient in descending order of predominance.
- Artificial flavoring and coloring must be listed for all food except butter, cheese, and ice cream.
- Labels must list all chemical preservatives.
- Food for special dietary needs must list vitamin and mineral content.
- For some items, the law provides "standards of identity." These manufacturers are exempt from listing ingredients. (bread, mayonnaise, butter, and ice cream)

If any nutrition claim is made on the label of a food package, it must include this *Nutrition Information:*
- serving size
- servings per container
- calories per serving
- grams of protein per serving
- grams of carbohydrate per serving
- grams of fat per serving
- percentages of the U.S. RDA of proteins, seven essential vitamins and minerals
- sodium content

See voluntary information in the opposite column.
Assign students to study their label and answer the study questions on the worksheet, "Informative Food Labels."
Ask some students to share their food label information. Allow for discussion.

RESOURCES & MATERIALS

Worksheet: "Informative Food Labels"

"A Consumer's Guide to Food Labels," FDA Consumer, HHS Publication (FDA) 88-2083

"Appendix G: Glossary of Terms"

Advanced Food Science and Nutrition. Home Economics Curriculum Center, Texas Tech University, P.O. Box 41161, Lubbock, Texas 79409-1161, (806) 742-3029

Voluntary information on labels include:
- brand name
- recipes using the product
- coupons for redemption
- picture of the product

ANSWER KEY

Answers for numbers 1, 2, 3, 4, 5, 7, 8, and 11 will vary.

6. Could write the company if there is a problem with the quality of the food, if enough nutritional information is not included, or to inquire about recipes from the company.

9. Nutrition information does not have to be included if there is no nutritional claim or additives.

10. Refer to "Appendix G: Glossary of Terms"

TEACHER TIP

Ask students to identify the food group of each food label.

ESSENTIAL ELEMENT

Vocational and applied technology education. Comprehensive home economics. Concepts and skills for managing food and nutrition for families and individuals. The student shall be provided opportunities to outline consumer management techniques for food and nutrition.

NAME ______________________________ **DATE** ________________

Informative Food Labels

- *Use the food label that you brought from home to answer the following questions. Use the back of this page if necessary.*
- *Staple your food label to your worksheet when you have completed the worksheet.*

1. List the information on your label which is required by law.

2. List the information found on your label which is voluntary.

3. List the nutrients and the amounts or percents which you receive from the food.

4. Would you want to buy the product just by looking at the label? If you were on a special diet, would it give sufficient information?

5. Is there a statement or claim on the label that is misleading?

6. What benefits to the consumer is the name and address of distributor, manufacturer, or packer on the label?

7. What can you, as a consumer, do to improve the quality of our food?

8. Write the additives listed on the label. Determine the purpose of each additive.

9. Why do some labels have nutrition information and others do not?

10. Define *Standard of Identity* as it applies to ingredient labeling. Give examples of foods to which this applies.

11. Describe additional label information which you think would be helpful to consumers.

LESSON OBJECTIVE

Investigate new developments in food trends.

ASSESSMENT CRITERIA

Determine the cost, the risk, and the acceptance of a new food product.

ACTIVITIES & STRATEGIES

Define ***entrepreneur***: a person who organizes and manages a business undertaking, assuming the risk for the sake of the profit.

Discuss the factors involved in becoming an entrepreneur:
- need to research the product
- risks involved in marketing a new food product
- cost of the product
- cost of preparation
- profit possibilities

Distribute the handout, "Ostriches: A New Agricultural Industry," and tell the students to read the handout individually.

Divide the class into several small discussion groups.

Distribute the worksheet, "Ostriches—A New Food Product."

Instruct the groups to discuss the questions, based on the information in the handout, then note the answers on the worksheet.

Each group should select a spokesperson to present the group's ideas to the class.

Allow for discussion after each group presentation.

RESOURCES & MATERIALS

Handout: "Ostriches: A New Agricultural Industry"

Worksheet: "Ostriches—A New Food Product"

Texas Agricultural Extension Service

Texas Department of Agriculture

ESSENTIAL ELEMENTS

Vocational and applied technology education. Agricultural science and technology. Concepts and skills associated with entrepreneurship. The student shall be provided opportunities to identify opportunities for business ownership.
Vocational and applied technology education. Diversified agriculture. The student shall be provided opportunities to identify opportunities to determine diversified animal enterprises.

Ostriches: A New Agricultural Industry

The ostrich industry is a fairly new industry for America. When the trade sanctions were imposed against South Africa in 1986, there were not enough ostrich hides to meet the demands despite imports from other countries. A group of individuals researched the possibilities of the industry for about two years and decided to form a corporation, and another family decided to invest in the ostrich business as a family project.

Some researchers believe the ostrich industry is presently a breeders' market because many others are entering the business. It probably will remain a breeders' market for eight to ten years or until the current ostrich population of 10,000 reaches approximately 200,000. The average price of each bird is $2,500. The purchase of four to five birds is the average investment for starting a business. A female starts laying eggs at two or three years of age and will continue to produce eggs until her 40s. During production, she produces an egg every other day. A fertile egg on the present market sells for $1,000 to $1,200.

Ostriches are about the size of a bantam chicken at birth and grow about a foot a month for the first six or seven months. They are bought when they are between three months of age up to approximately thirty months. By one year of age, the ostrich may weigh 200 pounds and be 8 or 9 feet tall.

Ostriches adapt to the West Texas climate because they can stand extreme heat as well as extremely cold weather. However, the ostrich is born with no immune system which does not develop fully until three months of age. The shell is porous and the unhatched birds breath through the eggshells. If there is too much humidity, the chicks can become wet and die.

Ostriches are branded. In some areas, the brand is recorded in the county clerk's office. The birds can injure themselves and they are usually placed in a high fenced area. Insurance on the birds can also be purchased after three months of age.

The meat is all red meat with very little fat, very little cholesterol, and is high in protein. There is no marbling. Some say it is slightly dry, but is tender enough that it can be cut with a fork. The meat source is the thighs.

Just as commercial feed companies prepare special mashes or mixtures for chickens, they prepare a special pellet for ostriches which resembles rabbit food. The commercial feed companies include the necessary minerals, vitamins, and other nutrients needed by the birds. The ostrich's body knows what it needs in the form of food. For instance after eating lettuce, it will immediately eat crushed granite which is provided for the birds.

A demand exists for the meat, hides, feathers, and the shells of the ostrich. The tough hides are valued for boots and other leather goods. Feathers derived from ostriches are in demand for cleaning computer equipment because they contain a natural chemical that attracts dust and dirt. The feathers and shells are used in home decorating and the feathers are also used in costumes.

NAME ______________________________ DATE ______________

Ostriches — A New Food Product

Answer the following questions. Use the back of the page if necessary.

1. Explain the reasons why researchers see a need for this type of enterprise.

2. Discuss the risk involved in raising ostriches.

3. Describe the type and quality of the ostrich meat. Compare the quality to other types of meats. Determine the acceptance of this type of new meat.

4. Discuss the precautions which must be used for the bird's safety.

5. Explain the importance of proper diet and care needed for the birds.

6. Discuss the type of food needed for birds such as ostriches and chickens. Where would one be able to purchase the type of food needed?

7. Determine the demands for ostrich products other than the meat. Evaluate the length of time the demand for these products would last.

8. As the production of ostriches grows, list and evaluate the protection needed by the owner or owners. Would this be sufficient protection?

9. Discuss the long-term effect of farmers entering ostrich production rather than continuing to produce their present crops such as grains, beef cattle, and dairy products.

10. Determine the cost of becoming an entrepreneur in the production of ostriches.

Vocational Education

High School

HS

TEXAS EDUCATION AGENCY

LESSON OBJECTIVE

Review current events in the field of nutrition.

ASSESSMENT CRITERIA

- Analyze menus used in the food service industry.
- Develop menu plans that are nutritionally balanced and aesthetically pleasing.

ACTIVITIES & STRATEGIES

An increasing percentage of American families are eating away from home. These consumers depend on the food service industry to provide them with nutritious, palatable, and aesthetically pleasing food choices.

Invite the cafeteria manager to be a guest speaker and discuss the considerations when menus are planned and written for the school cafeteria.

Distribute the handout, "Rules for Writing Menus," and discuss the rules and menus on the handout.
What are the advantages of writing menus correctly?

- Organized and neatly written menus are more impressive.
- Customers can determine more quickly if there are foods which should not be included in their diets.
- Customers can easily determine whether they are including all of the food groups for daily balanced meals.
- The menus are written in the order in which the food is served, so the customers will know what to expect.

Analyze the menus included on the handout.

- Are the meals well-balanced and nutritious?
- Customers are more nutrition conscious now. Are these menus high in fiber and low in saturated fat and sodium?
- What price would have to be charged for these meals? Would they be too expensive for the average American family?
- Are the menus aesthetically pleasing? Do the menus provide color, texture, and variety in shapes and sizes; variety in flavors to include some strong and some mild flavored foods; and a variety in temperature of the foods?

Assign each student to plan a day's menu.

- Write them in the correct menu form.
- Follow "Appendix C: A Pattern for Daily Choices."

Instruct students to check the menus according to the information discussed above.

RESOURCES & MATERIALS

Handout: "Rules for Writing Menus"

"Appendix C: A Pattern for Daily Food Choices"

In advance, invite the cafeteria manager to be a guest speaker to discuss the considerations when menus are planned and written for the school cafeteria.

ESSENTIAL ELEMENT

Vocational and applied technology education. Food production, management and services. Concepts and skills for coordinating various phases of meal planning, preparation, and service to ensure customer satisfaction. The student shall be provided opportunities to point out how various food combinations are aesthetically pleasing.

Rules for Writing Menus

- Capitalize all words except prepositions and conjunctions.
- Write the food in the order it is served.
- Describe the method of preparation of the food.
- Use a balanced form.
- The meat is written first when serving a family-style meal.
- The salad is written after the vegetables when serving a family-style meal.
- The bread and butter are written after the salad when serving family-style.
- The salad is written first when serving a three-course meal such as salad, main course, and dessert.
- The dessert is written just before the beverage.
- The beverage is always written last.

Example of a breakfast menu:

Orange Juice
Poached Eggs   Broiled Bacon
Biscuits   Margarine
Peach Preserves
Coffee   Milk
Hot Tea

Example of a dinner menu:

Broiled Steak
Mashed Potatoes   Gravy
English Peas
Tossed Vegetable Salad
Whole Wheat Rolls   Margarine
Angel Food Cake with Strawberries
Iced Tea   Milk
Coffee

Example of a three-course meal:

Tossed Vegetable Salad
Broiled Chicken Breast
Asparagus   Corn on the Cob
Whole Wheat Rolls   Margarine
Gelatin Fruit Dessert
Iced Tea   Coffee

This is an example of a banquet meal, a large family meal, or a restaurant meal when the salad would be served while preparing plates of the main course for the guests.

Appendix A
Suggested Teacher Resources

Books

American Heart Association Cookbook. 5th ed. Dallas: American Heart Association, 1991.

Archer, G.A., Psy.D. *Big Kids: A Parent's Guide to Weight Control for Children.* Oakland: New Harbinger Publications, Inc., 1989.

Avis, J.B., L.D.N., R.D., and Ward, K.F., L.D.N., R.D. *Just for Kids Cookbook.* West Monroe, LA: Central Printers and Publishers, 1990.

Benardot, D., Ph.D., R.D. *Four Steps to Less Fat and Better Nutrition.* Normal, IL: The Salonika Press, 1983.

Boskind-White, M., Ph.D., and White, Jr. W.C., Ph.D. *The Binge/Purge Cycle.* 2nd ed. New York, NY: Norton, 1987.

Cooper, N., R.D. *The Joy of Snacks.* Minnetonka, MN: DCI Publishing, 1991.

Eisenman, P.A., Ph.D., Johnson, S.C., Ph.D., and Benson, J.E., M.S. *Coaches Guide to Nutrition and Weight Control.* Champaign, IL: Leisure Press, 1990.

Franz, M.J., M.S., R.D. *Fast Food Facts.* Minnetonka, MN: DCI Publishing, 1990.

Gershoff, S., Ph.D., and Whitney, C. *The Tufts University Guide to Total Nutrition.* New York: HarperPerennial, 1990.

Grundy, S., M.D., Ph.D. *American Heart Association Low-Fat Low-Cholesterol Cookbook: An Essential Guide for Those Concerned about Their Cholesterol Levels.* New York: Random, 1989.

Hall, L., and Cohn, L. *Bulimia: A Guide to Recovery.* Carlsbad, CA: Gurze Books, 1986.

Hess, M.A., M.S., R.D., Hunt, A.E., and Stone, B.M. *A Healthy Head Start: A Worry-free Guide to Feeding Young Children.* New York: Henry Holt and Company, 1991.

Hirschmann, J.R., and Munter, C.H. *Overcoming Overeating.* New York: Fawcett, 1988.

Jacobson, M.S., Ph.D., and Hill, L., R.D. *Kitchen Fun for Kids.* New York: Henry Holt and Company, 1991.

Linsay, A. *The American Cancer Society Cookbook: A Menu for Good Health.* New York: Hearst Books, 1988.

Manahan, L., M.S., M.Ed., R.D. *The Adventures of Superbean and the Good Food Friends.* Walla Walla, WA: Yummy Designs, 1988.

Manahan, L., M.S., M.Ed., R.D. *The Good Food Puppets Come Alive!* Walla Walla, WA: Yummy Designs, 1990.

Mellin, L., M.A., R.D. *Shapedown: Weight Management Program for Adolescents*. San Francisco: Balboa Publishing, 1983.

Mond, A., R.D., and Franz, M.J., M.S., R.D. *Convenience Food Facts*. Minnetonka, MN: DCI Publishing, 1987.

Niethammer, C. *American Indian Food and Lore*. New York: Collier Books, Macmillan Publishing Company, 1974.

Pennington, J., Ph.D., R.D. *Bowes and Church's Food Values of Portions Commonly Used*. Philadelphia: J.B. Lippincott Company, 1989.

Romaniello, C., M.P.H., R.D., and Van Domelen, N. *Off to a Good Start*. Englewood, CO: Wildwood Resources Publishing, 1989.

Sacker, I.M., M.D., and Zimmer, M.A., Ph.D. *Dying to Be Thin*. New York: Warner Books, Inc., 1987.

Satter, E., M.S., R.D. *Child of Mine: Feeding with Love and Food Sense*. Menlo Park, CA: Bull Publishing Company, 1986.

Satter, E., R.D., A.C.S.W. *How to Get Your Kid to Eat...But Not Too Much*. Palo Alto, CA: Bull Publishing Company, 1987.

Smith, J. *The Frugal Gourmet on Our Immigrant Ancestors*. New York: William Morrow and Company, Inc., 1990.

Stanush, B.E. *Texans: A Story of Texas Cultures for Young People*. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1988.

Stark, R.D., M.D., and Winston, M., Ed.D., R.D. *American Heart Association Low-Salt Cookbook: A Complete Guide to Reducing Sodium and Fat in the Diet*. New York: Random, 1990.

Stein, P.M., R.D., and Unell, B. *Anorexia Nervosa: Finding the Lifeline*. Minneapolis: CompCare, 1986.

Tannahill, R. *Food in History*. New York: Crown Publishers, Inc., 1988.

The American Diabetes Association / The American Dietetic Association Family Cookbook. Vol. IV. New York: Prentice Hall, 1991.

The Danish Texans. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1987.

The English Texans. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1987.

The German Texans. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1987.

The Irish Texans. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1987.

The Japanese Texans. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1987.

The Melting Pot. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1989.

The Polish Texans. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1987.

The Wendish Texans. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1987.

Tribole, E., M.S., R.D. *Eating on the Run*. Champaign, IL: Human Kinetics, 1987.

Valette, B. *A Parent's Guide to Eating Disorders*. New York: Walker Publishing Company, 1988.

Visser, M. *Much Depends on Dinner*. New York: Collier Books, Macmillan Publishing Company, 1986.

Warner, P. *Healthy Snacks for Kids*. San Jacinto, CA: Bristol Publishing Company, 1989.

Zeller, P., and Jacobson, M.F., Ph.D. *Eat, Think, and Be Healthy!* Washington, DC: Center for Science in the Public Interest, 1987.

Pamphlets

The Texians and the Texans. San Antonio: The University of Texas Institute of Texan Cultures at San Antonio, 1987. A series of pamphlets dealing with the many peoples who have contributed to the history and heritage of Texas which include the following:

The Afro-American Texans
The Belgian Texans
The Chinese Texans
The Czech Texans
The German Texans
The Greek Texans
The Indian Texans
The Italian Texans
The Jewish Texans
The Mexican Texans
Los Tejanos Mexicanos (Spanish version)
The Norwegian Texans
The Spanish Texans
The Swiss Texans

Curriculum Kits

Food...Early Choices. Rosemont, IL: National Dairy Council, 1988.

Food Helps Me Grow, Grade 1. Rosemont, IL: National Dairy Council, 1988.

Food Gives Me Energy, Grade 2. Rosemont, IL: National Dairy Council, 1988.

Food Keeps Me Healthy, Grade 3. Rosemont, IL: National Dairy Council, 1988.

Food in America, Grade 4. Rosemont, IL: National Dairy Council, 1988.

Food and Technology, Grade 5. Rosemont, IL: National Dairy Council, 1988.

Food Decisions, Grade 6. Rosemont, IL: National Dairy Council, 1988.

Smart Moves, Grades 7-12. Rosemont, IL: National Dairy Council, 1991.

Food Power: A Coach's Guide to Improving Performance. 2nd ed. Rosemont, IL: National Dairy Council, 1991.

Healthy Choices: Balanced Meals Nutrition Education Program, Grade 2. Los Angeles: Dairy Council of California, 1990.

Daily Food Choices Secrets of Success Nutrition Education Program, Grades 4-5. Los Angeles: Dairy Council of California, 1981.

Nutrition, Food, and Culture. Chicago: National Live Stock and Meat Board, 1985.

Changing the Course, Lower Elementary. American Cancer Society, Inc., 1990.

Changing the Course, Upper Elementary. American Cancer Society, Inc., 1990.

Changing the Course, Intermediate. American Cancer Society, Inc., 1990.

Changing the Course, Secondary. American Cancer Society, Inc., 1990.

Changing the Course, School Foodservice Providers. American Cancer Society, Inc., 1990.

The Heart Treasure Chest. Austin: American Heart Association, Texas Affiliate, Inc., 1984.

Heart Explorers, Grade 1. Austin: American Heart Association, Texas Affiliate, Inc., 1987.

Heart Explorers, Grade 2. Austin: American Heart Association, Texas Affiliate, Inc., 1987.

Heart Explorers, Grade 3. Austin: American Heart Association, Texas Affiliate, Inc., 1987.

Getting to Know Your Heart, Lower Elementary. Dallas: American Heart Association Schoolsite Program, projected 1992.

Getting to Know Your Heart, Upper Elementary. Dallas: American Heart Association Schoolsite Program, 1989.

Heart Decisions, Middle School. Dallas: American Heart Association Schoolsite Program, 1989.

Heart Challenges, High School. Austin: American Heart Association, Texas Affiliate, Inc., 1989.

Project TEACH. Austin: Texas Department of Agriculture, 1991.

Videos

The following videos are available from the NET library at the following address:
Nutrition Education and Training Program
Texas Department of Human Resources
The Library 434-W
701 West 51st Street
P.O. Box 2960
Austin, Texas 78769
(512) 450-3530

Anorexia Nervosa: The Covert Rebellion gives an overview of the problem of anorexia nervosa, the psychology of eating, parent-child relationships, and distorted self-image. Appropriate for high school students.

Be Fair to Your Food tells how to protect food from unnecessary loss of nutrients through proper shopping, storing, and cooking. Appropriate for junior high and senior high school students.

Be Healthy, Be Happy emphasizes health rules of keeping clean, eating proper foods, getting enough rest and exercise, and taking care of yourself when you are sick and also shows the relationship of proper eating habits to staying healthy. Appropriate for prekindergarten through grade 3.

Bloodstream explores the role of arteries, veins, capillaries, nutrition, and the heart in the process of blood circulation. Appropriate for junior high and senior high school students.

Bulimia: Out of Control Eating discusses bulimia as a life threatening eating disorder. Appropriate for junior high and senior high school students.

Chef Good Munch Series uses puppets and humor to promote learning and induce positive changes in children's attitudes about vegetables. Appropriate for kindergarten through grade 4.

Cholesterol: What You Can Do discusses the link between a high blood cholesterol level and heart disease and provides information on cholesterol, lipoproteins, plaque build-up in arteries, and types of fat. Appropriate for grades 6 through 12.

Fast Food: What's in It for You gives information on nutrient content of fast foods and healthful alternatives. Appropriate for upper elementary, junior high, and senior high school students.

Fear of Fat: Dieting and Eating Disorders discusses eating disorders, including anorexia nervosa, compulsive overeating, and bulimia. Appropriate for grades 6 through 12.

Feeding shows the actual process of the human digestive system, beginning with food entering the mouth and ending with waste elimination. Appropriate for junior high and senior high school students.

Food and Growth introduces the concept that growth occurs by cell division and that food reaching the cells is necessary. Appropriate for grades 4 through 8.

Food Energy and You explains how the body uses energy and how food is a source of energy. Appropriate for grades 6 through 12.

Food: Keep It Safe to Eat presents basic information on food safety such as proper shopping methods, kitchen hygiene, safe defrosting, and food preparation tips. Appropriate for grades 6 through 12.

Health: Food and Nutrition covers the basics of proper nutrition and the importance of major nutrients. Appropriate for elementary school students.

Lunchroom Etiquette is filmed in an elementary school lunchroom and asks children to discuss their lunchtime environment and make suggestions for improvement. Appropriate for elementary school students.

Supermarket Savy covers techniques for wise consumer buying to enable students to learn how to get the most nutritious food for their money. Appropriate for upper elementary and middle school students.

Time for Table Manners uses Disney animation to show young children how to eat meals using good manners; includes washing before eating, setting the table, using eating utensils, cleaning up, and saying "please" and "thank you." Appropriate for grades 4 through 8.

Your Diet discusses carbohydrates, exercise, fats, fiber, salt/hypertension, and water. Appropriate for grades 6 through 12.

Appendix B
Bibliography

Books

Archer, G.A., Psy.D. *Big Kids: A Parent's Guide to Weight Control for Children*. Oakland: New Harbinger Publications, Inc., 1989.

Avis, J.B., L.D.N., R.D., and Ward, K.F., L.D.N., R.D. *Just for Kids Cookbook*. West Monroe, LA: Central Printers and Publishers, 1990.

Benardot, D., Ph.D., R.D. *Four Steps to Less Fat and Better Nutrition*. Normal, IL: The Salonika Press, 1983.

Briggs, G.M. *Nutrition and Physical Fitness*. 11th ed. New York: Holt, Rinehart and Winston, 1984.

Bryant, C.A., Courtney, A., Markesbery, B.A., and DeWalt, K.M. *The Cultural Feast*. St. Paul: West Publishing Company, 1985.

Creasy, D.N., and Creasy, J.A. *Exploring Foods*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1980.

Duyff, R.L., M.S., R.D., C.H.E., Hasler, D., M.S., C.H.E., and Ohl, S.S., M.S. *Modern Meals*. Dallas: McGraw-Hill School Division, 1990.

Eisenman, P.A., Ph.D., Johnson, S.C., Ph.D., and Benson, J.E., M.S. *Coaches Guide to Nutrition and Weight Control*. Champaign, IL: Leisure Press, 1990.

Gershoff, S., Ph.D., and Whitney, C. *The Tufts University Guide to Total Nutrition*. New York: HarperPerennial, 1990.

Hutchins, B. *Child Nutrition and Health*. Dallas: Gregg Division, McGraw-Hill Book Company, 1979.

Jacobson, M.S., Ph.D., and Hill, L., R.D. *Kitchen Fun for Kids*. New York: Henry Holt and Company, 1991.

Kowtaluk, H. *Discovering Nutrition*. Peoria, IL: Chas. A. Bennett Co., Inc., 1980.

Kowtaluk, H., and Kopan A.O. *Food for Today*. Mission Hills, CA: Glencoe, 1990.

Largen, V.L., C.H.E. *Guide to Good Food*. South Holland, IL: Goodheart-Willcox Company, Inc., 1988.

Long, P.J., and Shannon, B. *Nutrition an Inquiry into the Issues*. Englewood Cliffs, NJ: Prentice-Hall, 1983.

Mayesky, M. *Creative Activities for Children in the Early Primary Grades*. New York: Delmar Publishers, Inc., 1986.

Medved, E. *The World of Food*. Englewood Cliffs, NJ: Prentice-Hall, 1990.

Mehas, K.Y., and Rodgers, S.L. *Food Science and You*. Peoria, IL: Glencoe Division, Macmillan/McGraw-Hill, 1989.

Mellin, L., M.A., R.D. *Shapedown: Weight Management Program for Adolescents*. San Francisco: Balboa Publishing, 1983.

Nutrition Education — Choose Well Be Well. Sacramento: California State Department of Education, 1984.

Pennington, J., Ph.D., R.D. *Bowes and Church's Food Values of Portions Commonly Used*. Philadelphia: J.B. Lippincott Company, 1989.

Romaniello, C., M.P.H., R.D., and Van Domelen, N. *Off to a Good Start*. Englewood, CO: Wildwood Resources Publishing, 1989.

Sacker, I.M., M.D., and Zimmer, M.A., Ph.D. *Dying to Be Thin*. New York: Warner Books, Inc., 1987.

Satter, E., R.D., A.C.S.W. *How to Get Your Kid to Eat...But Not Too Much*. Palo Alto, CA: Bull Publishing Company, 1987.

Smith, J. *The Frugal Gourmet on Our Immigrant Ancestors*. New York: William Morrow and Company, Inc., 1990.

Tannahill, R. *Food in History*. New York: Crown Publishers, Inc., 1988.

Thompson, P.J., Ed.D., and Jax, J.A., Ph.D. *Teens in Action*. St. Paul: EMC Publishing, 1989.

Valette, B. *A Parent's Guide to Eating Disorders*. New York: Walker Publishing Company, 1988.

Visser, M. *Much Depends on Dinner*. New York: Collier Books, Macmillan Publishing Company, 1986.

Wardlaw, G.M., Ph.D., R.D., L.D., and Insel, P.M., Ph.D. *Perspectives in Nutrition*. St. Louis: Times Mirror/Mosby College Publishing, 1990.

White R.B. *Food and Your Future*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1985.

Whitney, E.N., Ph.D., R.D., and Boyle, M.A., M.S., R.D. *Understanding Nutrition*. 4th ed. St. Paul: West Publishing Company, 1987

Worthington-Roberts, B.S., Ph.D., Vermeersch, J., R.D., Dr.P.H., and Williams, S.R., M.P.H., M.R.Ed., Ph.D., R.D. *Nutrition in Pregnancy and Lactation*. St. Louis: Times Mirror/Mosby College Publishing, 1985.

Zeller, P., and Jacobson, M.F., Ph.D. *Eat, Think, and Be Healthy!* Washington, DC: Center for Science in the Public Interest, 1987.

Curriculum Kits

Changing the Course, Lower Elementary. American Cancer Society, Inc., 1990.

Changing the Course, Upper Elementary. American Cancer Society, Inc., 1990.

Changing the Course, Intermediate. American Cancer Society, Inc., 1990.

Changing the Course, Secondary. American Cancer Society, Inc., 1990.

Changing the Course, School Foodservice Providers. American Cancer Society, Inc., 1990.

The Heart Treasure Chest. Austin: American Heart Association, Texas Affiliate, Inc., 1984.

Heart Explorers, Grade 1. Austin: American Heart Association, Texas Affiliate, Inc., 1987.

Heart Explorers, Grade 2. Austin: American Heart Association, Texas Affiliate, Inc., 1987.

Heart Explorers, Grade 3. Austin: American Heart Association, Texas Affiliate, Inc., 1987.

Getting to Know Your Heart, Lower Elementary. Dallas: American Heart Association Schoolsite Program, projected 1992.

Getting to Know Your Heart, Upper Elementary. Dallas: American Heart Association Schoolsite Program, 1989.

Heart Decisions, Middle School. Dallas: American Heart Association Schoolsite Program, 1989.

Heart Challenges, High School. Austin: American Heart Association, Texas Affiliate, Inc., 1989.

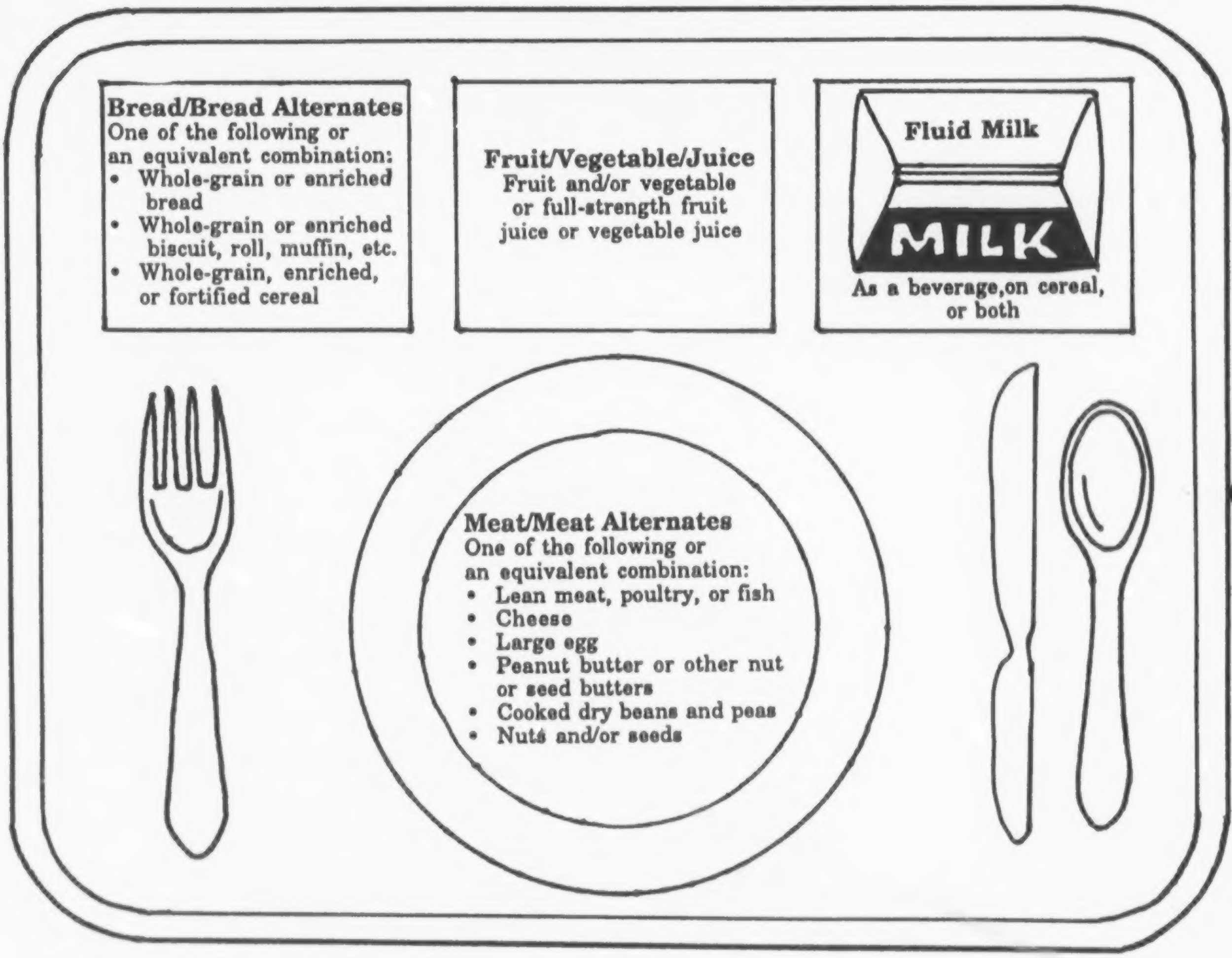
Appendix C: A Pattern for Daily Food Choices

FOOD GROUPS	SUGGESTED DAILY SERVINGS	WHAT EQUALS A SERVING?
Vegetables • Dark green leafy • Deep yellow • Starchy • Other vegetables	**3 - 5** servings from entire group (Include all types regularly; use dark green leafy vegetables and deep yellow vegetables several times a week.)	▲ 1/2 cup of cooked vegetables ▲ 1/2 cup of chopped raw vegetables ▲ 1 cup of leafy raw vegetables, such as lettuce or spinach
Fruits • Citrus, melon, berries • Other fruits	**2 - 4** servings from entire group	▲ a whole fruit such as a medium apple, banana, or orange ▲ a grapefruit half ▲ a melon wedge ▲ 3/4 cup of juice ▲ 1/2 cup of berries ▲ 1/2 cup cooked or canned fruit ▲ 1/4 cup dried fruit
Breads, Cereals, Rice, and Pasta • Whole-grain • Enriched	**6 -11** servings from entire group (Include several servings of whole-grain products daily.)	▲ 1 slice of bread ▲ 1/2 hamburger bun, English muffin, or bagel ▲ a small roll, biscuit, or muffin ▲ 3 to 4 small or 2 large crackers ▲ 1/2 cup cooked cereal, rice, or pasta ▲ 1 ounce of ready-to-eat breakfast cereal ▲ 1 tortilla or pancake
Milk, Yogurt, and Cheese	**2** servings for adults **3** servings for children **4** servings for ages 11-24 (3 servings for women who are pregnant or breast-feeding and for teens; 4 servings for teens who are pregnant or breast-feeding)	▲ 1 cup of low-fat milk ▲ 8 ounces low-fat yogurt ▲ 1 1/2 ounces of low-fat natural cheese ▲ 2 ounces low-fat process cheese
Meat, Poultry, Fish, Dry beans and Peas, Eggs, Nuts, and Seeds	**2 - 3** servings from entire group (Include dry beans and peas often.)	▲ 2 - 3 ounces equals one serving of cooked lean meat, poultry, or fish. Count 1 egg, 1/2 cup cooked dried beans, or 2 T. peanut butter as 1 ounce of meat.

Adapted from: "Nutrition and Your Health: Dietary Guidelines for Americans," United States Departments of Agriculture and Health and Human Services, U.S. Government Printing Office, 1750 K Street, N. W., Washington, DC, 20006, 1990.

Appendix C

The School Breakfast Pattern



Bread/Bread Alternates
One of the following or an equivalent combination:
- Whole-grain or enriched bread
- Whole-grain or enriched biscuit, roll, muffin, etc.
- Whole-grain, enriched, or fortified cereal

Fruit/Vegetable/Juice
Fruit and/or vegetable or full-strength fruit juice or vegetable juice

Fluid Milk
As a beverage,on cereal, or both

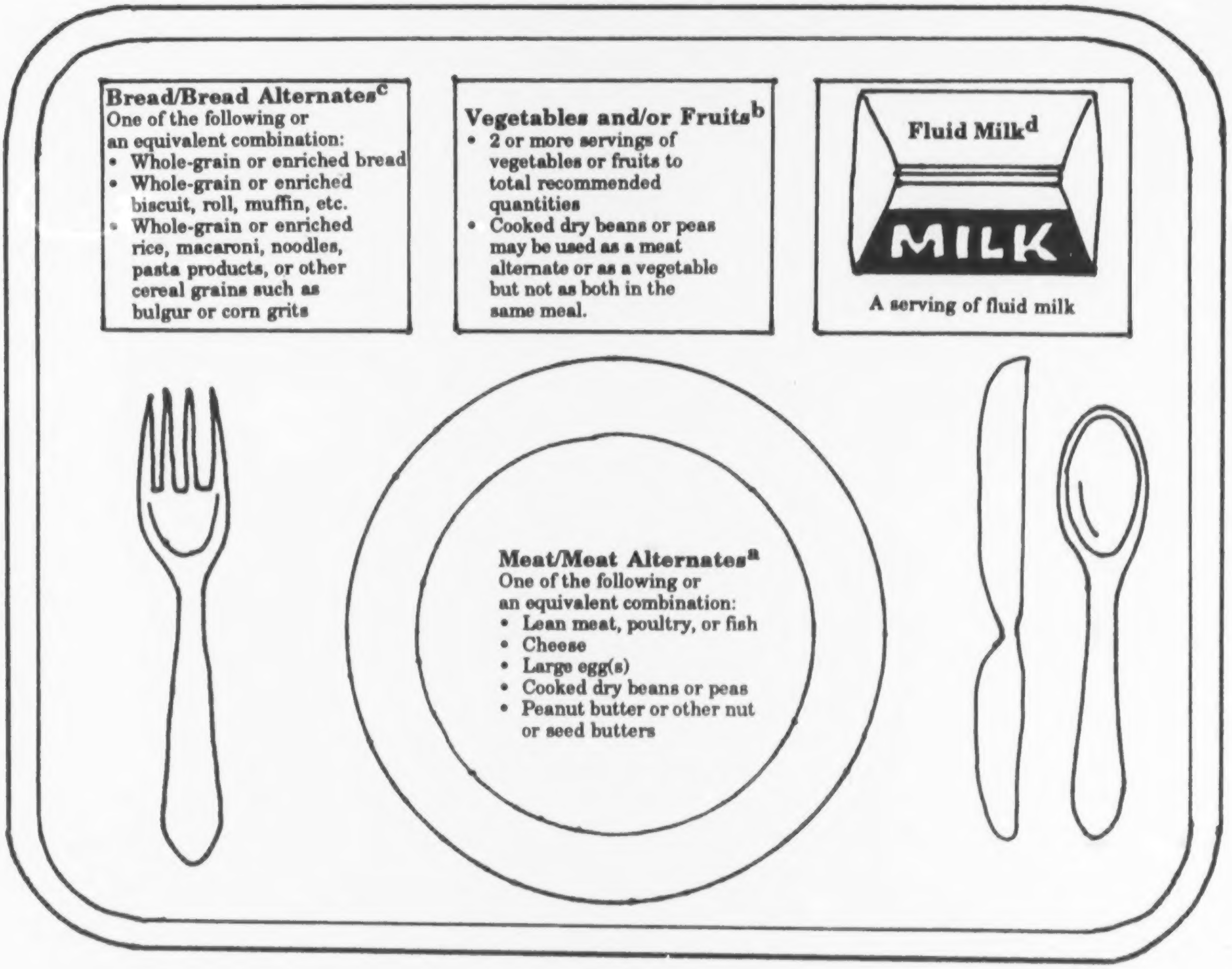
Meat/Meat Alternates
One of the following or an equivalent combination:
- Lean meat, poultry, or fish
- Cheese
- Large egg
- Peanut butter or other nut or seed butters
- Cooked dry beans and peas
- Nuts and/or seeds

One serving of milk and one serving of fruit and/or vegetable or full-strength fruit juice or vegetable juice are required.

Students may select one serving from Bread/Bread Alternates and one serving from Meat/Meat Alternates, or they may select two servings from either Bread/Bread Alternates or Meat/Meat Alternates.

Appendix C

The School Lunch Pattern



Bread/Bread Alternates[c]
One of the following or
an equivalent combination:
- Whole-grain or enriched bread
- Whole-grain or enriched biscuit, roll, muffin, etc.
- Whole-grain or enriched rice, macaroni, noodles, pasta products, or other cereal grains such as bulgur or corn grits

Vegetables and/or Fruits[b]
- 2 or more servings of vegetables or fruits to total recommended quantities
- Cooked dry beans or peas may be used as a meat alternate or as a vegetable but not as both in the same meal.

Fluid Milk[d]
A serving of fluid milk

Meat/Meat Alternates[a]
One of the following or
an equivalent combination:
- Lean meat, poultry, or fish
- Cheese
- Large egg(s)
- Cooked dry beans or peas
- Peanut butter or other nut or seed butters

---

[a] Peanuts, soy nuts, tree nuts, or seeds meet no more than 50% of the requirement and must be combined in the meal with at least 50% of other meat or meat alternate. (1 oz. of nuts/seeds is equal to 1 oz. of cooked lean meat, poultry, or fish.)

[b] No more than 1/2 of the total requirement may be met with full-strength fruit or vegetable juice.

[c] Enriched macaroni with fortified protein may be used as a meat alternate or as a bread alternate but not as both in the same meal.

[d] Whole milk and unflavored low-fat milk must be offered. This requirement does not prohibit offering other milk, such as flavored milk or skim milk, along with the above.

Appendix D
Food and Nutrition Board, National Academy of Sciences – National Research Council Recommended Dietary Allowances[a]

							Fat-Soluble Vitamins				Water-Soluble Vitamins							Minerals						
Category	Age (years) or Condition	Weight (kg)	Weight (lb)	Height (cm)	Height (in)	Protein (g)	Vitamin A (μg R.E.)[b]	Vitamin D (μg)[c]	Vitamin E (mg α-T.E.)[d]	Vitamin K (μg)	Vitamin C (mg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg N.E.)[e]	Vitamin B_6 (mg)	Folate (μg)	Vitamin B_{12} (μg)	Calcium (mg)	Phosphorus (mg)	Magnesium (mg)	Iron (mg)	Zinc (mg)	Iodine (μg)	Selenium (μg)
Infants	0.0-0.5	6	13	60	24	13	375	7.5	3	5	30	0.3	0.4	5	0.3	25	0.3	400	300	40	6	5	40	10
	0.5-1.0	9	20	71	28	14	375	10	4	10	35	0.4	0.5	6	0.6	35	0.5	600	500	60	10	5	50	15
Children	1-3	13	29	90	35	16	400	10	6	15	40	0.7	0.8	9	1.0	50	0.7	800	800	80	10	10	70	20
	4-6	20	44	112	44	24	500	10	7	20	45	0.9	1.1	12	1.1	75	1.0	800	800	120	10	10	90	20
	7-10	28	62	132	52	28	700	10	7	30	45	1.0	1.2	13	1.4	100	1.4	800	800	170	10	10	120	30
Males	11-14	45	99	157	62	45	1,000	10	10	45	50	1.3	1.5	17	1.7	150	2.0	1,200	1,200	270	12	15	150	40
	15-18	66	145	176	69	59	1,000	10	10	65	60	1.5	1.8	20	2.0	200	2.0	1,200	1,200	400	12	15	150	50
	19-24	72	160	177	70	58	1,000	10	10	70	60	1.5	1.7	19	2.0	200	2.0	1,200	1,200	350	10	15	150	70
	25-50	79	174	176	70	63	1,000	5	10	80	60	1.5	1.7	19	2.0	200	2.0	800	800	350	10	15	150	70
	51+	77	170	173	68	63	1,000	5	10	80	60	1.2	1.4	15	2.0	200	2.0	800	800	350	10	15	150	70
Females	11-14	46	101	157	62	46	800	10	8	45	50	1.1	1.3	15	1.4	150	2.0	1,200	1,200	280	15	12	150	45
	15-18	55	120	163	64	44	800	10	8	55	60	1.1	1.3	15	1.5	180	2.0	1,200	1,200	300	15	12	150	50
	19-24	58	128	164	65	46	800	10	8	60	60	1.1	1.3	15	1.6	180	2.0	1,200	1,200	280	15	12	150	55
	25-50	63	138	163	64	50	800	5	8	65	60	1.1	1.3	15	1.6	180	2.0	800	800	280	15	12	150	55
	51+	65	143	160	63	50	800	5	8	65	60	1.0	1.2	13	1.6	180	2.0	800	800	280	10	12	150	55
Pregnant						60	800	10	10	65	70	1.5	1.6	17	2.2	400	2.2	1,200	1,200	320	30	15	175	65
Lactating	1st Six Months					65	1,300	10	12	65	95	1.6	1.8	20	2.1	280	2.6	1,200	1,200	355	15	19	200	75
	2nd 6 Months					62	1,200	10	11	65	90	1.6	1.7	20	2.1	260	2.6	1,200	1,200	340	15	16	200	75

[a] The allowances, expressed as average daily intakes over time, are intended to provide for individual variations among most normal persons as they live in the United States under usual environmental stresses. Diets should be based on a variety of common foods in order to provide other nutrients for which human requirements have been less well defined.

[b] Retinol equivalents. 1 retinol equivalent = 1 μg retinol or 6μg β-carotene.

[c] As cholecalciferol. 10 μg cholecalciferol = 400 I.U. of vitamin D.

[d] α-Tocopherol equivalents. 1 mg d-α tocopherol = 1 α-TE.

[e] 1 N.E. (niacin equivalent) is equal to 1 mg of niacin or 60 mg of dietary tryptophan.

Adapted from *Recommended Dietary Allowances, 10th Edition*, c. 1989 by the National Academy of Sciences. Published by National Academy Press, Washington, D.C.

Appendix D

Median Heights and Weights and Recommended Energy Intake

Category	Age (years) or Condition	Weight (kg)	Weight (lb)	Height (cm)	Height (in)	REE[a] (kcal/day)	Average Energy Allowance (kcal)[b]		
							Multiples of REE	Per kg	Per day[c]
Infants	0.0-0.5	6	13	60	24	320		108	650
	0.5-1.0	9	20	71	28	500		98	850
Children	1-3	13	29	90	35	740		102	1,300
	4-6	20	44	112	44	950		90	1,800
	7-10	28	62	132	52	1,130		70	2,000
Males	11-14	45	99	157	62	1,440	1.70	55	2,500
	15-18	66	145	176	69	1,760	1.67	45	3,000
	19-24	72	160	177	70	1,780	1.67	40	2,900
	25-50	79	174	176	70	1,800	1.60	37	2,900
	51+	77	170	173	68	1,530	1.50	30	2,300
Females	11-14	46	101	157	62	1,310	1.67	47	2,200
	15-18	55	120	163	64	1,370	1.60	40	2,200
	19-24	58	128	164	65	1,350	1.60	38	2,200
	25-50	63	138	163	64	1,380	1.55	36	2,200
	51+	65	143	160	63	1,280	1.50	30	1,900
Pregnant	1st trimester								+0
	2nd trimester								+300
	3rd trimester								+300
Lactating	1st Six Months								+500
	2nd 6 Months								+500

[a] Calculation of REE (Resting Energy Expenditure) based on FAO equations, then rounded.
[b] In the range of light to moderate activity, the coefficient of variation is ±20%.
[c] Figure is rounded.

Estimated Safe and Adequate Daily Dietary Intakes of Selected Vitamins and Minerals[a]

Category	Age (years)	Vitamins		Trace Elements[b]				
		Biotin (μg)	Pantothenic Acid (mg)	Copper (mg)	Manganese (mg)	Fluoride (mg)	Chromium (μg)	Molybdenum (μg)
Infants	0.0-0.5	10	2	0.4-0.6	0.3-0.6	0.1-0.5	10-40	15-30
	0.5-1.0	15	3	0.6-0.7	0.6-1.0	0.2-1.0	20-60	20-40
Children and Adolescents	1-3	20	3	0.7-1.0	1.0-1.5	0.5-1.5	20-80	25-50
	4-6	25	3-4	1.0-1.5	1.5-2.0	1.0-2.5	30-120	30-75
	7-10	30	4-5	1.0-2.0	2.0-3.0	1.5-2.5	50-200	50-150
	11+	30-100	4-7	1.5-2.5	2.0-5.0	1.5-2.5	50-200	75-250
Adults		30-100	4-7	1.5-3.0	2.0-5.0	1.5-4.0	50-200	75-250

[a] Because there is less information on which to base allowances, these figures are not given in the main table of RDA and are provided here in the form of ranges of recommended intakes.
[b] Since the toxic levels for many trace elements may be only several times usual intakes, the upper levels for the trace elements given in this table should not be habitually exceeded.

Estimated Sodium, Chloride, and Potassium Minimum Requirements of Healthy Persons[a]

	Age	Weight (kg)[a]	Sodium (mg)[a,b]	Chloride (mg)[a,b]	Potassium (mg)[c]
Mths	0-5	4.5	120	180	500
	6-11	8.9	200	300	700
Years	1	11.0	225	350	1,000
	2-5	16.0	300	500	1,400
	6-9	25.0	400	600	1,600
	10-18	50.0	500	750	2,000
	>18[d]	70.0	500	750	2,000

[a] No allowance has been included for large, prolonged loses from the skin through sweat.
[b] There is no evidence that higher intakes confer any health benefit.
[c] Desirable intakes of potassium may considerably exceed these values (3,500 mg for adults).
[d] No allowance included for growth. Values for those below 18 years assume a growth rate at the 50th percentile reported by the National Center for health Statistics (Hamill et al., 1979 in reference 1) and averaged for males and females.

Adapted from *Recommended Dietary Allowances, 10th Edition*, c. 1989 by the National Academy of Sciences. Published by National Academy Press, Washington, D.C.

Appendix E: Food Composition Table

FOODS	WT (g)	KCAL	PRO (g)	CHO (g)	FAT (g)	PUFA (g)	SFA (g)	CHOL (mg)	A (RE)	C (mg)	B-1 (mg)	B-2 (mg)	NIA (mg)	Ca (mg)	Fe (mg)	Na (mg)
Vegetables																
Broccoli, frozen, chopped 1/2 cup	92	25	2.9	4.9	0.1	0.1	0	0	174	37	0.05	0.08	0.4	47	0.56	22
Carrots, canned, 1/2 cup slices	73	17	0.5	4	0.1	0.1	0	0	1006	2	0.01	0.02	0.4	19	0.47	176
Green beans, canned, 1/2 cup	68	13	0.8	3.1	0.1	0	0	0	24	3	0.01	0.04	0.1	18	0.61	170
Lettuce salad, 1/2 cup shredded	28	5	0.4	1	0.1	0	0	0	53	5	0.01	0.02	0.1	19	0.39	3
Potatoes, hash brown, homemade 1/2 cup	78	163	1.9	16.6	10.9	1.3	4.2	*	*	5	0.06	0.02	1.6	6	0.63	19
Spinach, 1/2 cup boiled	90	21	2.7	3.4	0.2	0.1	0	0	737	9	0.09	0.21	0.44	122	3.21	63
Tomato, 1 raw	123	24	1.1	5.3	0.3	0.1	0	0	139	22	0.07	0.06	0.7	8	0.59	10
Fruits																
Apple, raw w/ skin 1 med.	138	81	0.3	21.1	0.5	0.1	0.1	0	7	8	0.02	0.02	0.1	10	0.25	1
Apricots, raw 3 med.	106	51	1.5	11.8	0.4	0.1	0	0	277	11	0.03	0.04	0.6	15	0.58	1
Banana, raw 1 med.	114	105	1.2	26.7	0.6	0.1	0.2	0	9	10	0.05	0.11	0.6	7	0.35	1
Grapes, raw 1 cup	92	58	0.6	15.8	0.3	0.1	0.1	0	9	4	0.09	0.05	0.3	13	0.27	2
Kiwi, raw 1 med.	76	46	0.8	11.3	0.3	*	*	*	13	75	0.02	0.04	0.4	20	0.31	4
Orange, raw 1 med.	140	65	1.4	16.3	0.1	0	0	0	26	80	0.12	0.06	0.4	56	0.17	1
Orange juice, from concentrate, 8 fl. oz.	249	112	1.7	26.8	0.1	0	0	0	19	97	0.20	0.05	0.5	22	0.24	2
Orange juice, fresh, 8 fl. oz.	248	111	1.7	25.8	0.5	0.1	0.1	0	50	124	0.22	0.07	0.1	27	0.50	2
Peach, raw 1 med.	87	37	0.6	9.7	0.1	0	0	0	47	6	0.02	0.04	0.9	5	0.10	0
Pear, canned light syrup, 1 cup	251	144	0.5	38.1	0.1	0	0	0	0	2	0.03	0.04	0.4	13	0.70	13
Plum, raw 1 med.	66	36	0.5	8.6	0.4	0.1	0	0	21	6	0.03	0.06	0.3	2	0.07	0
Prune juice, 8 fl. oz.	256	181	1.6	44.7	0.1	0	0	0	1	11	0.04	0.18	2	30	3.03	11
Raisins, seedless 2/3 cup	100	300	3.2	79.1	0.5	0.1	0.2	0	1	3	0.16	0.09	0.8	49	2.08	12
Strawberries, raw, 1 cup	149	45	0.9	10.5	0.6	0.3	0	0	4	85	0.03	0.10	0.3	21	0.57	2
Breads and Cereals, Rice, and Pasta																
Bran flakes, 3/4 cup 1 oz.	28	93	3.6	22.2	0.5	*	*	*	375	*	0.40	0.40	5	14	8.10	264
Macaroni, enriched, cooked 1 cup	140	159	5.2	33.7	0.7	*	*	0	*	0	0.20	0.11	1.5	11	2.25	1
Oatmeal, quick, old fashioned, 1/3 cup dry	28	109	4.6	18.4	1.9	*	*	*	*	*	0.19	0.03	0.2	14	1.08	1
Oatmeal, w/ raisins and spice 1 pkg. prep.	158	161	4.3	31.8	1.8	*	*	*	440	*	0.51	0.36	5.5	165	6.58	225
Popcorn, air popped, 1 cup	6	23	0.8	4.6	0.3	*	0	*	*	1	*	0.01	0.1	1	0.20	0
Popcorn, w/ fat and salt, 1 cup	9	41	0.9	5.3	2	*	0.9	*	*	0	*	0.01	0.2	1	0.20	175
Pretzels, 1 oz.	28	111	2.6	22.4	1	*	*	*	*	0	0.09	0.07	1.2	7	0.55	451
Rice, white enriched, cooked, 1/2 cup	80	85	2	19	0	0	0	0	0	0	0	0	1	22	0.70	0
Rolls, dinner/pan 1 roll	28	85	2.4	14	2.1	*	*	*	*	0	0.14	0.09	1.1	33	0.83	155
Wheat bread, 1 slice	24	61	2.3	11.3	1	*	*	0	*	0	0.11	0.08	1.1	30	0.84	129
White bread, 1 slice	24	64	2	11.7	0.9	*	*	*	*	0	0.11	0.07	0.9	30	0.68	123
Whole wheat bread, 1 slice	25	61	2.4	11.4	1.1	*	*	*	*	0	0.09	0.05	1	18	0.86	159

FOODS	WT (g)	KCAL	PRO (g)	CHO (g)	FAT (g)	PUFA (g)	SFA (g)	CHOL (mg)	A (RE)	C (mg)	B-1 (mg)	B-2 (mg)	NIA (mg)	Ca (mg)	Fe (mg)	Na (mg)
Milk, Yogurt, and Cheese																
Lowfat milk 2% fat, 8 fl. oz.	244	121	8.1	11.7	4.7	0.2	2.9	18	140	2	.10	.40	0.2	297	122	122
Skim milk, 8 fl. oz.	245	86	8.4	11.9	0.4	0	0.3	4	149	2	.09	.34	0.2	302	0.10	126
Skim (nonfat dry milk) 8 fl. oz.	245	90	8.8	12.3	0.6	0	0.4	5	149	2	.10	.43	0.2	316	0.12	130
Whole milk, 3.3% fat 8 fl. oz.	227	150	8.0	11.4	8.2	0.3	5.1	33	76	2	.09	.40	0.2	291	0.12	120
Lowfat yogurt 8 fl. oz.	227	144	11.9	16	3.5	0.1	2.3	14	36	2	.10	.49	0.3	415	0.18	159
Fruit flavor yogurt 8 fl. oz.	28	225	9.0	42.3	2.6	0.1	1.7	10	27	1	.08	.37	0.2	314	0.14	121
American, processed cheese 1 oz.	28	106	6.3	0.5	8.9	0.3	5.6	27	82	0	.01	.10	0	124	0.11	406
Cheddar cheese, 1 oz.	28	114	7.1	0.4	9.4	0.3	6.0	30	86	0	.01	.11	0	204	0.19	176
Monterey cheese, 1 oz.	28	106	6.9	0.2	8.6	*	*	*	*	0	*	.11	*	212	0.20	152
Mozzarella cheese, 1 oz.	28	79	7.8	0.9	4.9	0.1	3.1	15	54	0	.01	.10	0	207	0.07	150
Swiss cheese, 1 oz.	28	107	8.1	1	7.8	0.3	5	26	72	0	.01	.10	0	272	0.05	74
Ice cream, vanilla 10% fat 1 cup	133	269	4.8	31.7	14.3	0.5	8.9	59	133	1	.05	.33	0.1	176	0.12	116
Meat, Poultry, Fish, Dry Beans and Peas, Eggs, Nuts and Seeds																
Bacon, cured, 3 med. pieces	19	109	5.8	0.1	9.4	1.1	3.3	16	0	6	0.13	0.05	1.4	2	0.31	303
Beef, ground, baked well done 3.5 oz.	100	274	30.3	0	16	0.6	6.3	107	*	0	0.05	0.31	5.4	9	2.96	64
Beef and vegetable stew, 1 cup	245	218	15.7	15.2	10.5	*	4.9	*	*	17	0.15	0.17	4.7	29	2.90	91
Chicken, light meat w/o skin, roasted	100	173	30.9	0	4.5	1	1.3	85	9	0	0.07	0.12	12.4	15	1.06	77
Egg, 1 large fried	46	83	5.4	0.5	6.4	0.7	2.4	246	83	0	0.03	0.13	0	26	0.92	144
Peanut butter, 1 Tbsp.	16	95	4.6	2.2	8.2	2.5	1.7	0	*	*	0.01	0.01	1.9	5	0.30	75
Peanuts, dry roasted 1 oz.	28	164	6.6	6.0	13.9	4.4	1.9	0	0	0	0.12	0.03	3.8	15	0.63	228
Peanuts, oil roasted 1 oz.	28	165	7.6	5.3	14	4.4	1.9	0	0	0	0.08	0.03	4.2	24	0.54	4
Pinto beans, 1 cup boiled	171	236	14	43.9	0.9	0.3	0.2	0	0	4	0.32	0.16	0.7	82	4.47	3
Pork chops w/brown gravy 6.5 oz. entree	184	252	22.1	4.4	16.2	*	*	*	*	1	0.43	0.20	4.3	9	2.50	367
Sausage, fresh 1 link	13	48	2.6	0.1	4.1	0.5	1.4	11	*	0	0.10	0.03	0.6	4	0.16	168
Sunflower seeds, 1 oz.	28	165	5.5	6.8	14.1	9.3	1.5	0	*	*	0.03	0.07	2	20	1.1	1
Fast Foods																
Cheeseburger, 1 reg. sandwich	112	299	14.8	28.3	15.1	*	*	45	*	1	0.26	0.24	3.7	136	2.33	672
French fries, 3 oz.	85	274	3.4	33.1	14.2	*	*	14	*	5	0.11	0.03	1.8	14	0.71	30
Hamburger, w/ 4 oz. meat	174	444	24.9	37.6	21.1	*	*	71	*	2	0.38	0.38	7.8	75	4.84	762
Pizza, cheese 1 slice	120	290	14.6	39.1	8.6	*	*	56	*	2	0.34	0.29	4.2	220	1.61	698
Pizza, pepperoni 1 slice	120	306	13	36.7	11.5	*	*	*	*	2	0.32	0.29	5.1	196	2.52	817

FOODS	WT (g)	KCAL	PRO (g)	CHO (g)	FAT (g)	PUFA (g)	SFA (g)	CHOL (mg)	A (RE)	C (mg)	B-1 (mg)	B-2 (mg)	NIA (mg)	Ca (mg)	Fe (mg)	Na (mg)
Miscellaneous																
Cola, 12 fl. oz.	370	151	0.1	38.5	0.1	*	*	0	0	0	0	0	0	9	0.13	14
Cola, diet, 12 fl. oz.	355	2	0.2	0.3	0	0	0	0	0	0	0.02	0.08	0	12	0.11	21
Orange soda, 12 fl. oz.	372	179	0	45.8	0	*	*	0	*	0	0	0	0	15	0.26	52
Milk choc. bar, 1.65 oz.	47	254	3.8	27.1	14.5	*	*	*	*	*	0.04	0.17	0.2	94	0.52	36
Milk choc. w/ almonds	28	151	2.6	14.5	10.1	*	4.5	*	*	0	0.02	0.12	0.2	65	0.50	23
Peanut butter and choc. bar, 2 oz.	57	260	4	38	12	*	*	*	*	*	*	*	*	*	*	100
Peanut bar, 1.6 oz.	45	240	8	21	14	*	*	*	*	*	*	*	*	*	*	110
Bite-size fruit snacks, 1 pouch	26	100	1	21	2	*	*	*	*	*	*	*	*	*	*	105
Corn chips, 1 oz.	28	153	1.7	16.6	8.8	*	*	*	*	0	0.05	0.3	0	2	*	218
Potato chips, 1 oz.	28	148	1.8	14.7	10.1	5.2	2.6	0	0	12	0.04	0.01	1.2	7	0.34	133
Tortilla chips, reg. or nacho 1 oz.	28	150	2	18	8	*	*	*	*	*	*	*	*	*	*	155
Brownie w/nuts—homemade 1 brownie	20	97	1.3	10.2	6.3	*	1.4	*	*	0	0.04	0.02	0.1	8	0.40	50
Cake, devil's food—homemade 1 piece	60	227	3.4	30.4	11.3	*	*	*	*	0	0.08	0.11	0.7	68	1.03	160
Doughnuts, yeast, 1 doughnut	42	176	2.7	16	11.3	*	2.8	*	*	0	0.07	0.07	0.8	16	0.60	99
Pie, cherry—homemade, 1/8 pie	118	308	3.1	45.3	13.3	*	3.5	*	*	0	0.02	0.02	0.6	17	0.40	359
Margarine, soft 1 Tbsp.	*	100	0	0	11	4	2	0	*	*	*	*	*	*	*	95
Molasses, blackstrap, 1 Tbsp.	20	43	0	11	0	0	0	*	*	*	0.02	0.04	0.4	137	3.20	19
Salad dressing—thousand island, 1 Tbsp.	16	59	0.1	2.4	5.6	3.1	0.9	*	50	*	*	*	*	2	0.10	109
Sugar, white granulated, 1 tsp.	4	15	0	4	0	0	0	*	*	0	0	0	0	0	0	0

Sources: USDA Food Handbooks

*Denotes "information not available." Do not assume that the value would be zero.

LEGEND

WT=weight
KCAL=calories
PRO=protein
CHO=carbohydrate
FAT=fat
PUFA=polyunsaturated fatty acids
SFA=saturated fatty acids
CHOL=cholesterol
A(RE)=vitamin A (retinol equivalent)
C=vitamin C (ascorbic acid)
B-1=vitamin B-1 (thiamin)
B-2=vitamin B-2 (riboflavin)
NIA=niacin
Ca=calcium
Fe=iron
Na=sodium

The nutrient data provided in Appendix E: Food Composition Table should be seen only as an approximation and used strictly as a guide in learning activities.

The many factors which affect the amounts of nutrients in foods include:

- animal diets
- mineral content of soil
- types of fertilizer used on samples
- season of the year
- method of storage
- length of storage
- processing methods
- methods of analysis
- moisture content of analyzed samples
- method of food preparation

Therefore, many different nutrient values will be reported in a variety of reliable resources.

Appendix F

Nutrition and Your Health: DIETARY GUIDELINES FOR AMERICANS

1 **Eat a variety of foods.**
People need more than forty different nutrients for good health. Essential nutrients include vitamins, minerals, amino acids from protein, certain fatty acids from fat, and sources of calories (protein, carbohydrates, and fat). These nutrients should come from a variety of foods, not from a few highly fortified foods or supplements. Get the nutrients needed by choosing different foods you enjoy eating from five major food groups. These groups are vegetables, fruits, grain products, milk and milk products, and meats and meat alternatives.

2 **Maintain desirable weight.**
Being overweight or underweight increases chances of developing health problems. Obesity is common in the United States. It is linked with high blood pressure, heart disease, stroke, the most common type of diabetes, certain cancers, and other types of illness.

3 **Choose a diet low in fat, saturated fat, and cholesterol.**
The higher levels of saturated fat and cholesterol in the diet are linked to increased risk for heart disease. A diet low in fat makes it easier to include the variety of foods you need for nutrients without exceeding your calorie needs because fat contains over twice the calories of an equal amount of carbohydrates or protein.

4 **Choose a diet with plenty of vegetables, fruits, and grain products.**
Vegetables, fruits, and grain products are important parts of a varied diet discussed in the first guideline. They are emphasized in this guideline especially for their complex carbohydrates, dietary fiber, and other food components linked to good health.

5 **Use sugars only in moderation.**
Sugars and many foods that contain them in large amounts supply calories but are limited in nutrients. Thus, they should be used in moderation by most healthy people and sparingly by people with low calorie needs. The more often these foods—even in small amounts—are eaten the greater the risk for tooth decay.

6 **Use salt and sodium only in moderation.**
Table salt contains sodium and chloride—both are essential in the diet. However, most Americans eat more salt and sodium than they need. In the United States, about one in three adults has high blood pressure. If these people restrict their salt and sodium, usually their blood pressure will fall.

7 **Avoid alcoholic beverages.**
Drinking alcoholic beverages is illegal in Texas for people under age 21. Heavy drinking of alcoholic beverages is related to malnutrition, liver disease, and some forms of cancer. Drinking alcoholic beverages during pregnancy can damage the developing fetus. People who drink alcoholic beverages before driving increase their risk of car accidents.

Sources: U.S. Department of Agriculture and U.S. Department of Health and Human Services *Home and Garden Bulletin* No. 232, "Nutrition and Your Health: Dietary Guidelines for Americans," Third edition, 1990.
U.S. Department of Agriculture and Human Nutrition Information Service, *Dietary Guidelines and Your Diet: Home Economics Teacher's Guide*, February 1988.

Appendix G
Glossary

Additive–A substance added to a food product to improve nutritional value, color, flavor, texture, or shelf life.

Amino Acids–The structural units of proteins.

Anorexia Nervosa–An eating disorder characterized by an obsessive and compelling desire to be thin.

Artificial Sweeteners–Synthetic substances used as sweetening agents in foods and beverages.

Atherosclerosis–An accumulation of lipid plaque within the arterial wall which results in a narrowing of the artery; sometimes referred to as "hardening of the arteries."

Bacteria–Single-celled organisms that can live anywhere people can live.

Basal Metabolism–The amount of energy your body needs to maintain basic processes at rest.

Bulimia Nervosa–An eating disorder characterized by self-induced vomiting or by the use of laxatives following binge eating.

Calorie–A unit of measure used to state the energy content of different foods. It is referred to as "kcalorie" in most science and nutrition texts.

Carbohydrate Loading–A diet that is very high in complex carbohydrates. Four or five days prior to an event lasting more than two hours, about 65-70 percent of total calories are consumed as complex carbohydrates in an attempt to increase muscle glycogen stores.

Carbohydrates–Nutrients that supply energy for body functions; simple carbohydrates are called sugars. Starch, glycogen, and some fibers are complex carbohydrates.

Cardiovascular Disease–A term that covers all of the diseases of the heart and blood vessels.

Cellulose–The fibrous material found in plants that is commonly referred to as fiber or roughage. It is indigestible by humans.

Cholesterol–An odorless, soft, waxy substance found in every cell in the body.

Colostrum–A thick alkaline fluid with a lemon yellow color, suited to the immature digestive enzyme system of the newborn. It is rich in protein and also contains antibodies.

Complementary Proteins–The combining of two or more foods that each lack some amino acids in such a way that the essential amino acids are supplied by the other.

Complete Proteins–Proteins that come from animal sources such as meat, milk, cheese, eggs, poultry and fish. Complete proteins supply all of the essential amino acids.

Complex Carbohydrates–Starches, glycogen, and fibers.

Cruciferous–Vegetables in the cabbage family whose leaves form a cross. They have been shown to protect against cancer in laboratory animals.

Culture–The knowledge, beliefs, customs, and traditions shared by a group of people within a society.

Custom–A practice or way of doing things that has been handed down from one generation to the next.

Deficiency–Lacking in something essential. Nutritional deficiency occurs when sufficient amounts of essential nutrients are not present in the diet.

Diabetes–A genetic disorder in which the body does not produce or properly use insulin. It is the inability of the body to metabolize or use glucose, also known as sugar, properly.

Disaccharides–Carbohydrate that is formed when two glucose molecules are joined together.

Ethnic Group–A group of people with common racial and/or cultural characteristics such as religion, language, national origin, or tradition which makes them a distinct subgroup of society. These characteristics are based on physical or cultural traits or both.

Electrolytes–Minerals that affect the way fluid is distributed in the body and aid the nervous system in transmitting the nerve impulses that control muscle action.

Enrichment–The process in which the nutrients that have been lost in processing are replaced in amounts equal to those originally present or in increased amounts.

Essential Amino Acids–Amino acids that must be provided by the diet. The body cannot produce essential amino acids sufficiently to meet the body's needs. There are nine essential amino acids.

Fat–Semisolid, energy-filled organic compounds called lipids that are found in animal and plant tissues. The body stores excess energy in the form of fat.

Fat-soluble Vitamins–Vitamins A, D, E, and K. They cannot be dissolved in water, so they are stored in body fat until they are transported to the cells by the blood.

Fiber–A group of substances found in plants that the body's digestive tract is unable to break down.

Food Binge–The overindulgence of food without control or rational judgment concerning the amount being consumed.

Food Chain–The system in which matter and energy are transferred from organism to organism in the form of food.

Food Web–The linkage of organisms to one another by their dependence on each other for food.

Food-borne Infection–A disease caused by eating food containing harmful microorganisms.

Food-borne Intoxication–An illness caused by poisons or toxins in the food a person eats.

Formulated Foods–Food products developed to supplement diets and feeding programs for people who are malnourished or suffering from some nutritional deficiency. Also includes foods that combine nutrients into the exact proportions needed by a certain group of people such as formulas for feeding babies.

Fortification–The addition of nutrients that may or may not be found naturally in a product.

Glucose–The major sugar found in the bloodstream that supplies energy to the body.

Glycogen–The body's storage form of glucose.

Hypertension–High blood pressure.

Incomplete Proteins–Protein foods that do not contain all of the essential amino acids needed by the body.

Lactation–The secretion or formation of milk; the period of milk production.

Lactovegetarian Diet–A diet that consists of only plant foods and dairy products.

Lacto-ovo-vegetarian Diet–A diet that consists of only plant foods, dairy products, and eggs.

Light or Lite–There are no legal definitions for this term.

Linoleic Acid–One of the essential fatty acids that must be provided in the diet. It is found in leafy, green vegetables and corn, safflower, and soybean oils.

Lipids–A term used interchangeably with the word fat to describe fats, oils, and fat-related substances.

Macrominerals–Minerals found in large amounts in the body.

Malnutrition–The term that refers to either undernutrition or overnutrition.

Meat Analogues–Food products made from plant proteins that have been shaped and formed to resemble meat products. An example is tofu.

Megadose–Large doses of nutrients, usually vitamins, for treatment or prevention of an ailment, often self-prescribed.

Microminerals–Minerals that are found in small amounts in the body; they are also called trace elements.

Microorganisms–Organisms that are so small they can only be seen through a microscope. They include molds, yeasts, and bacteria.

Monosaccharides–The simplest form of carbohydrates.

Monounsaturated Fats–Fats that have less hydrogen than saturated fats; can be found in avocados, peanut oil, canola oil, and olive oil.

Nutrient Density–A description of the amount of nutrients a food contains compared to its calories.

Nutrient–Life sustaining chemical substances that nourish and promote the growth of the human body.

Nutrients–Invisible substances that work with the body to help people grow and have energy for work and play.

Nutrition–The study of nutrients and how the body uses them.

Oil-free–A food that contains no oil, no fat, and is cholesterol free, unless egg yolks are included.

Oils–Lipids that are in a liquid state at room temperature.

Plaque–Mounds of lipid matter that accumulate on the inner walls of the arteries.

Polysaccharides–Complex carbohydrates.

Polyunsaturated Fats–Fats that come from vegetable oils and fish oils.

Promoter–A substance that does not initiate cancer but does favor its development once the initiating event has occurred.

Protector Foods–Foods that may help lower the risk of certain cancers.

Protein Packing–A diet that overloads on protein.

RDA–The Recommended Dietary Allowances for Americans that serves as a guideline for determining the amounts of nutrients a normal, healthy individual needs each day.

Reduced Calorie–A food label term that refers to a food that contains at least one-third fewer calories than the food it most resembles.

Refinement–The removal of the bran and germ from cereal grains during processing. These cereals provide only calories and incomplete protein unless they have been enriched.

Restoration–The process of replacing nutrients in a food product that were lost during processing.

Saturated Fats–Fats that are found in animal foods such as meat and dairy products and in oils such as coconut oil and palm oil.

Shelf Life–The length of time a food holds its original flavor and quality.

Simple Carbohydrates–Any of the sugars.

Standard of Identity–Specifications set by the FDA that list the ingredients a food must contain if it is to be called by a particular name (catsup, mayonnaise, ice cream, etc). The ingredients do not have to be listed on the food label if the product meets the standard of identity.

Starch–The most abundant polysaccharide; a complex form of carbohydrate.

Stir-frying–The quick cooking and stirring of foods in a tiny amount of oil or fat over high heat.

Synthetic Foods–Manufactured food products that are made from artificial chemicals that resemble those naturally found in foods.

Thermic Effect of Food–The amount of energy used by the body during digestion and absorption of nutrients from food.

Tofu–A cake-like product made from soybeans and water into a bean curd high in protein with few calories.

Triglycerides–The chemical structure of fat that contains carbon, hydrogen, and oxygen atoms. Most fats in the body and in food are in the form of triglycerides.

Unit Pricing–A system in which stickers on store shelves give costs per unit of weight or per quantity for each product.

Vegen Diet–A diet that consists of only plant foods such as fruits, vegetables, legumes, nuts, seeds, and grains. All animal products are omitted from the diet.

Vegetarian Diet–A diet consisting only or primarily of plant products; no meat is consumed.

Viruses–The smallest and perhaps simplest form of life known. They cause illnesses such as colds, influenza, and infectious hepatitis.

Vitamins–Organic compounds that are necessary in the diet in small amounts for normal growth, maintenance of health, and reproduction.

Water-soluble Vitamins–Vitamins that are easily dissolved by water and therefore are not stored in the body; the B vitamins and vitamin C.

Whole Grain–Grains and grain products containing the entire seed of the plant including the bran, the germ, and the endosperm.

Yeasts–Fungi that require sugar, moisture, and proper temperature for survival.

Appendix H
Suggested Instructional Strategies

1. abstracts
2. advertisement
3. art gallery
4. attitude scales
5. block picture story
6. book cover
7. brainstorming
8. bulletin board
9. buzz groups
10. cardboard relief
11. cartoons
12. case study
13. chart
14. checklist
15. choral reading
16. cinquain
17. city council meeting
18. collage
19. computer games
20. computer reviews
21. computer problems
22. construction
23. costume
24. creative writing
25. crosscut diagram
26. debate
27. demonstration of a technique
28. diagrams/drawings
29. diamante
30. diorama
31. discussions
32. ditto
33. editorial
34. essay
35. exhibits
36. experiment
37. fact file
38. fairy tale
39. field trips
40. films
41. flannel boards
42. flip book
43. game board
44. geometric shapes
45. glossary
46. greeting card
47. guest speaker
48. haiku
49. illustrated story
50. interrupted film
51. interview
52. jigsaw puzzle
53. journals
54. laboratory experiences
55. letter (friendly)
56. letter to the editor
57. limerick
58. magazines
59. maps
60. minicenters
61. mobiles
62. models
63. movie making
64. mural
65. museum
66. newscast
67. newspaper story
68. news report
69. observation
70. one-act play
71. oral report
72. pamphlet
73. panel discussion
74. pantomime
75. photo essay
76. picture dictionary
77. picture with information and diagram
78. pictures (photographs)
79. play
80. poem
81. poster
82. project cube
83. puppet
84. puppet show
85. questionnaires
86. rating scales
87. rebus story
88. recordings
89. role playing
90. samples
91. science fiction story
92. score cards
93. scrapbook
94. simulation experiences
95. skit
96. slides
97. song (original)
98. songs (collection)
99. stained glass
100. stencil
101. stitchery
102. story
103. storytelling
104. survey
105. taped recording
106. television game show
107. textbook
108. town meeting
109. transparency
110. T-shirt design
111. vocabulary
112. window-shade story, game, poster
113. worksheet
114. written reports

Appendix I
Health Hotline of Agencies and Organizations

Eating Disorders

American Anorexia/Bulimia Association, Inc.
133 Cedar Lane
Teaneck, New Jersey 07666
(210) 836-1800

Anorexia Nervosa and Associated Disorders, Inc.
P.O. Box 7
Highland Park, Illinois 60035

Bulimia, Anorexia Self-Help
6125 Clayton Ave., Suite 215
St. Louis, Missouri 63139
(800) 227-4785

Center for the Study of Anorexia and Bulimia
One W. 91st St.
New York, New York 10024
(212) 595-3449

National Anorexic Aid Society, Inc.
5796 Karl Road
Columbus, Ohio 43229
(614) 436-1112

Food Labeling, Legislation, Policy, and Safety

Center for Food Safety and Applied Nutrition
Food and Drug Administration
200 C St. S.W., Room 3321
Washington, D.C. 20204
(202) 245-1236

Center for Science in the Public Interest
1501 16th St. N.W.
Washington, D.C. 20036
(202) 332-9110

Food and Drug Administration, Consumer Inquiries
5600 Fishers Lane
Rockville, Maryland 20857
(301) 443-3170

Food Safety and Inspection Service
Information Division
Department of Agriculture
14th St. and Independence Ave. S.W.
Washington, D.C. 20250
(202) 447-9113

Nutrition Education and Health Information

American Cancer Society
Medical Library
4 West 34th St.
New York, New York 10001
(212) 736-3030

American Diabetes Association
505 8th Ave.
New York, New York 10018
(212) 947-9707

American Heart Association
7320 Greenville Ave.
Dallas, Texas 75231
(214) 750-5300

Centers for Disease Control
Office of Public Affairs
1600 Clifton Road N.E.
Atlanta, Georgia 30333
(404) 329-3286

Juvenile Diabetes Foundation
60 Madison Ave.
New York, New York 10010
(800) 223-1138

National Diabetes Information Clearinghouse
Box NDIC
Bethesda, Maryland 20892
(301) 468-2162

Beltsville Human Nutrition Research Center
Ag Research Service
U.S. Department of Agriculture
Room 223, Bldg. 308
Beltsville, Maryland 20705
(301) 244-2157

National Cancer Institute
NIH Bldg. 31, Room 10A18
Bethesda, Maryland 20892
(301) 496-5583

Bureau of Health Care Delivery and Assistance
Health Resources and Services Administration
Public Health Service
Parklawn Building, Room G-05
5600 Fishers Lane
Rockville, Maryland 20857
(301) 443-2320

Community Nutrition Institute
2001 S St. N.W.
Washington, D.C. 20009
(202) 462-4700

Human Nutrition Information Service
Food and Consumer Services
U.S. Department of Agriculture
6505 Belcrest Road
Hyattsville, Maryland 20782
(301) 436-7725

National Health Information Clearinghouse
P.O. Box 1133
Washington, D.C. 20013
(800) 336-4797

President's Council on Physical Fitness and Sports
450 Fifth St. N.W., Room 7103
Washington, D.C. 20001
(202) 272-3421

Tufts University Diet and Nutrition Letter
80 Boylston St., Suite 353
Boston, Massachusetts 02116
(617) 482-3530

American Dietetic Association
126 W. Jackson Boulevard, Suite 800
Chicago, Illinois 60606-6995
(800) 366-1655

National Dairy Council
6300 N. River Road
Rosemont, Illinois 60018-4233
(708) 696-1860

Nutrition Education and Training Program
Texas Department of Human Resources
The Library 434-W
701 West 51st Street
P.O. Box 2960
Austin, Texas 78769
(512) 450-3530

Texas Agricultural Extension Service
Special Services Bldg., Room 205 B
Texas A&M University
College Station, Texas 77843
(409) 845-1146

Food Industry Associations

Food Marketing Institute
1750 K St. N.W.
Washington, D.C. 20006
(202) 452-8444

Food Processors Institute
1401 New York Ave. N.W., Suite 400
Washington, D.C. 20005
(202) 393-0890

Grocery Manufacturers of America
1010 Wisconsin Ave. N.W., Suite 800
Washington, D.C. 20007
(202) 337-9400

Milk Industry Foundation
888 16th St. N.W., 2nd Floor
Washington, D.C. 20006
(202) 296-4250

National Association of Wheat Growers
415 Second St. N.E., Suite 300
Washington, D.C. 20002
(202) 547-7800

National Meat Association
734 15th St. N.W.
Washington, D.C. 20005
(202) 347-1000

Wheat Flour Institute
600 Maryland Ave. S.W.
Washington, D.C. 20024
(202) 484-2200

Texas Beef Industry Council
8310 Capitol of Texas Highway
Austin, Texas 78731
(512) 345-3531

Associated Milk Producers, Inc. (AMPI)
Consumer Services
P.O. Box 5007
Arlington, Texas 76005
(817) 461-2674

Florida Department of Citrus
School Marketing Department
P.O. Box 148
Lakeland, Florida 33802

National Livestock and Meat Board
444 N. Michigan Ave.
Chicago, Illinois 60611

Texas Education Agency
1701 North Congress Avenue
Austin, Texas 78701

1992

BEST COPY AVAILABLE